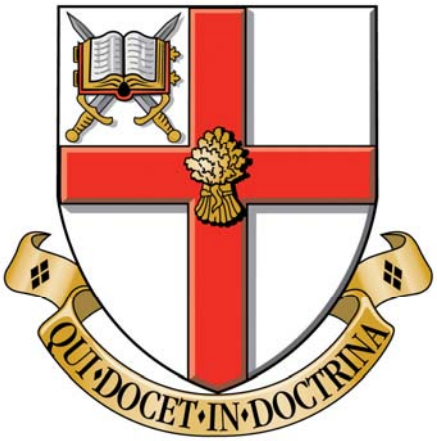

University of Chester

A Case Study to Critically Explore One Tutor's Use of Questions to Promote Interactive Teaching on a PGCE Programme

Dissertation submitted in accordance with the requirements of the University of Chester for the Degree of Master of Arts in part fulfilment of the Modular programme

Joy Roberts

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Abstract

Interactive teaching involves an increased interchange between teachers, students and the lecture content. The use of interactive teaching can promote active learning, heighten motivation, give feedback to teachers and students and increase satisfaction for both. Questioning is probably one of the most frequently used interactive teaching techniques used by teachers. The aim of this "small scale" research is to explore my use of questions as a means to develop a more interactive style of teaching on a one year programme of study. The Professional Development Education (PDE) course on the Post Graduate Certificate of Education (PGCE) Programme in the School of Education at the University of Chester has a prescribed curriculum content which has to be taught and assessed within this one year time frame.

This case study is an attempt to explore the reasons for asking questions, to analyse the different types of questions asked and evaluate the ways of asking questions that promote active and reflective learning. It took the form of a questionnaire, a transcript of one hour's teaching on the PDE course and semi structured interviews with a group of the students. There are fifteen students on the PGCE programme and fourteen out of the fifteen students agreed to participate in the study. Fourteen questionnaires were completed and returned. The questions that were asked in an hour's teaching were taped and transcribed. On the same day that the teaching session was recorded I conducted seven individual semi-structured interviews with students.

Relevant literature was reviewed focusing on the central theme of questioning. Research dating from the early twentieth century reveals that there are many ways to ask a question and some ways are more effective than others. Thinking about the types and levels of questions that can be asked or even preparing specific questions prior to a teaching session often leads to more effective classroom discussions. Although many studies have failed to find any relationship between the "level" of question and student achievement, many others have shown that students learn more in classrooms where teachers use a mix of analytical and evaluative questions than in those classrooms where teachers ask students mainly to recognise or recall facts.

This case study focused on the following key questions:

- Why ask questions?
- What type of questions are most commonly asked?
- How are questions asked?
- What are the effects of a questioning approach to teaching on students' attitudes?

The major findings to emerge from the case study were:

- Students believed that a questioning approach to teaching encouraged interaction in the classroom

- Findings from the questionnaire, the transcript and the semi-structured interviews showed that questions were a way of checking students' understanding and knowledge as well as sharing experiences.
- Students believed that questions were used to extend their knowledge despite this not correlating with the transcript of the teaching session
- Questions which were part of a sequence of four or more questions centred on a similar topic
- Positive relationships between students and students and teacher were important factors when using a questioning approach to teaching.
- That there is scope for further research on how students' answers are responded to by each other and the teacher.

Recommendations based on the results of the research were made. Firstly, that there is a need to prepare fewer and better questions. These questions need to include those which require students to be more analytical and evaluative and which encourage students to question each others' answers as well as questioning the teacher. Secondly, how questions are distributed to the group and individuals needs to be considered more carefully by the teacher. Thirdly, more time for students to respond to questions before rephrasing the question or answering the question oneself needs to be given. Lastly that this research be seen as a starting point for future research by individuals and colleagues in the School of Education on how to improve questioning to develop a more interactive approach to teaching.

The major conclusion from this case study is that I must be more aware of the reasons for asking the questions and the type of questions I am asking and develop my use of the effective questioning practices discussed.

Declaration

This work is original and has not been previously submitted in support of a Degree, qualification or other course.

Signed .....

Date .....

Contents

Chapter 1

Introduction and research focus

The focus of this study originates from comments made by students on their evaluations of the Professional Development Education (PDE) course which is a central component of the Post Graduate Certificate in Education (Early Years) (P.G.C.E. E.Y.) programme of study within the School of Education at the University of Chester. The P.G.C.E. E.Y. is an intense one year programme of study which is currently being taught on the Warrington Campus. P.D.E. is a course which focuses on generic issues associated with learning and teaching in the school context. Currently, due to the design of the timetable the P.D.E. course is taught over a whole day (six hours of student- tutor contact).

The P.G.C.E. curriculum is prescribed in Qualifying to Teach (Q.T.T.) (T.T.A. 2002) and as such there is a body of knowledge that has to be taught and assessed. Curriculum coverage is therefore important as students have to meet all the standards listed in the Circular 02/02 and the P.D.E. course is where all the standards are introduced and examined with the students. I believe that the delivery of the course should take account of the two orientations of teaching; that of transmitting knowledge and that of facilitating learning. Some elements of the course are introduced to the students in the form of information, transmitting knowledge, such as the requirements of the Special Education Needs Code of Practice, (D.f.E.S.2001). Other issues are drawn from students' existing professional knowledge and experience and are introduced in a way which encourages the

students to reflect on what they know and their relationship to the underpinning theories and values of early years education. In terms of this research focus, that of exploring my use of questions to develop a more interactive style of teaching, I am constantly aware of the tension and battle within myself about how to teach the content whilst also encouraging the trainees to become independent and reflective learners. By independent I mean going beyond what is given to them in terms of information in the teaching sessions. I want them to have the confidence to research and develop their own perspectives and syntheses of the subject and this could mean being ready and willing to learn alone and/or with others and not being so reliant on me. To be a reflective learner, I believe students need to become more strategic about their learning and understand themselves better as learners. This belief has been influenced by the work of Claxton (2002) who in his work on Building Power advocates a move away from "teaching more" to that of "learning better". The P.D.E. course has a heavy workload, an excessive amount of material to be covered and an anxiety provoking assessment procedure. The students, 2004-2005 cohort, on their evaluations of P.D.E, highlighted the amount of content that was to be covered in each session as a problem. They stated that there was a lack of opportunity to pursue topics in depth and that there was sometimes an over reliance of tutor explanation. This has led me to consider how my teaching could be made more interactive and in particular how questions could be used more effectively as a tool to promote teaching and learning.

A research focus on the use of questioning is potentially a massive area; for example although I wish to focus on the value of tutors' questioning I am aware that this is also inextricably linked to students' use of questioning, "active learning" and "deep surface learning". Such terminology can be defined in different ways depending on the learning context and the personal interpretation. However for the purpose of this study "deep learning" that which encourages students to go beyond what I tell them (surface approach) can be defined as an approach to learning where students make connections with their learning and have the confidence to play with ideas.

One of the standards within Qualifying to Teach (TTA 2002, p.12) states that trainees should demonstrate their ability to "employ **interactive** teaching methods." In the associated Handbook of Guidance (TTA 2005, p.46) it details how this should be achieved by trainees' use of "clear task setting and providing opportunities for **questioning** and clarification." From my observations in schools, trainees have interpreted the notion of 'interactive teaching methods' in a variety of ways. For example some have conceptualised 'interactive teaching' as simply doing practical work. Such thinking is similar to findings of Pollard (2002, p.26) who argues that "Children were believed to be actively learning as long as they were for example cutting and gluing". For other trainees, 'interactive teaching' appears to mean that children had to be physically active eg moving around. I would argue that non verbal signals, alongside verbal signals, play an important part in interaction. Similarly Reed (cited in Dantonio & Beisenherz 2001, p.2) supports this view "Watch any interaction between people for more than a few seconds and you will see a dance of signs and a drama of actions, which cannot be reduced to spoken language alone."

Based on my own experience, observation of teachers and trainees and through inspection, both as an inspector and being inspected, I believe that a common way that teachers and trainees can encourage 'interactive teaching' is by using questions. Questions, if well planned, can promote reflection, critical thinking, evaluation and discussion. I acknowledge that all these terms can be interpreted differently and as part of my literature review the different viewpoints will be explored. Developing my own use of questioning, will I believe, move me from a teacher-led mode of learning and teaching ie that of the well recognised exposition model, to a more learner centred approach, where questions rather than answers play a primary role in shaping students' development as learners. It is my belief that if students see education as something that is done to them by other people they may lose the ability to take any initiative or responsibility for their own learning. Watkins, C., Carnell, E., Lodge, C., Wagner, P., & Whalley, C. (2002, p.1) advocate a move from a directed programmed learning approach to an open framework approach where questioning and problem solving are used to promote learning stating that;

> *Learning...that reflective activity which enables the learner to draw upon previous experiences to question and evaluate the present, so as to shape future action and formulate new knowledge.*

The pedagogic argument for using questions as part of an interactive teaching method to promote learning, alongside the students' feedback from my teaching has prompted me to start to think more critically about how I teach on the P.D.E. course. Indeed I am an advocate of an interactive approach to teaching; that being where students are encouraged to solve problems, synthesise information, have time to

think through answers to questions and relate it to previous knowledge within a learning orientated environment.

Having accepted the use of questioning as a means to promote active learning then a logical step from this would be the embedding of questioning within my own teaching practice. However enactment of beliefs and values is rarely straightforward. As such I have questioned my reluctance to use questioning in the P.D.E. course(highlighted in students' evaluations of my teaching) in favour of the use of exposition and have come up with some possible reasons:

Fear; fear of not covering the curriculum as prescribed in Q.T.T. (2002)

Anxiety; that by focusing on questions rather than answers I would make the trainees aware of what they don't know. They may also think that I don't know and this could lead them to question my knowledge and expertise.

Relationships; that by encouraging trainees to express doubts and curiosity through my probing questions I might be seen as not being supportive and this could have a negative effect on relationships within the group.

Furthermore, the use of questioning as a means to promote active learning could lead to *unpredictable* learning which in turn would make me feel vulnerable. These reasons were identified on the preparation form for my peer observation (appendix v) The feedback comments highlighted issues which are at the heart of this research, for example, too much focus on content rather than the process of learning, asking and responding to questions in a didactic way, too few *open* type questions.

In this research I intend to reflect on and refine my current views and practice about the use of questions in the learning and teaching process. The focus group for the study will be the trainees on the P.G.C.E. EY programme (2005-2006). To assist with my critique and the evaluation of my practice I will draw on theories of questioning and associated research findings. From the outset I shall refrain from taking a deficit model approach to the issue being explored preferring to focus on what can or is being done rather than what is not being done. The research will be directed towards a greater understanding and improvement of practice rather than looking at my use of questioning as a 'management issue' that is wrong or needs to be fixed. I also intend the research findings to have some practical use to my colleagues in the School of Education and to the students on the programme, in terms of their own teaching of pupils in class, who will have access to my findings.

Hustler, Cassidy and Cuff (1986) begin their book by stating that a good many teachers find little relevance or practicality in traditional educational research. What is needed, they say, are positive suggestions to help with problems and above all evidence from well founded research to improve the learning experience of pupils. This, I believe, is a worthwhile statement. As such, one of the over riding aims of this research into my use of questioning is that it will have a positive effect on the learning and teaching process for trainees and tutors within Initial Teacher Training (I.T.T.).

Research aim and objectives

On the assumption that questions are the most common form of interaction between students and teachers and given research findings which indicate that questioning:

- is the key means by which teachers find out what students already know
- can identify gaps in knowledge and understanding
- scaffolds the development of students' understanding to enable them to close the gap between what they currently know and the learning intentions of a session,

this research will explore how questions are used to promote interactive learning and critical thinking. The specific objectives of the research are:

- to review theoretical ideas regarding interactive teaching and learning via the use of questions
- to develop a framework of questioning behaviours to test out within my own teaching practice with a view to enhancing the students' learning and to facilitate the learning process.

Whilst the issue of questioning is not simply that of asking more questions, for the purpose of this research dissertation, an emphasis will be placed on the type of questions being asked by the tutor and how they can promote more interactive teaching methods leading towards 'deep learning'.

Chapter 2

Review of related literature on the use of questions in learning and teaching

In this chapter I will be critically discussing the various theories or models of learning associated with the use of questioning and examining the existing research on teachers' use of questions in the classroom. Particular emphasis will be given to:

- why questions are part of teachers' repertoire of teaching skills
- how questions differ in their nature and effectiveness and
- how teachers can ask better questions and ask them more effectively

The chapter will begin by asking the question, "Why ask questions?" Theoretical considerations associated with the promotion and facilitation of learning, such as the work of some prominent learning theorists and current research into the use questioning will then be examined. The discussion will progress out to the application of theory into the practice in the classroom, more specifically examining the predominant types of questions used and how the teacher asks them. How teachers respond to answers and how their responses affects students' attitudes to learning as well as the enhancement of their knowledge and understanding will then be analysed. Mindful of the difficulties associated with such a study to do with the breadth of coverage, I am hopeful that a review of the literature will assist me in clarifying a tighter focus for my research. For example the results of Hargie's (1978) research claimed that both oral and written questions promoted students' learning. However he went on to conclude that oral questions were more effective. Hargie (1978) believed that listening to teachers' questions and answering by

speaking was easier for many students than reading questions and answering them. Mindful of the research being "small scale" and because of the personal and professional reasons for my engagement with this focus I intend to confine my review of literature to the study of spoken questions which occur during regular teaching sessions. Throughout the discussion subheadings will be used to guide the reader. Due to the interconnectivity of the themes there will be some overlap of sections and at times terms will be referred to which will be expanded on in later sections.

Why ask questions?

Claxton (2002) believes that good learning starts with questions, not answers, the consensus being that questioning leads to more effective learning and more enjoyable teaching. Kerry (2002) similarly argues that questioning can transfer the emphasis in learning from the teacher to the student. The teacher, through the questions asked enquires, probes and challenges and the students are therefore required to think, speculate and contribute. Goh (2004) also believes that if we move from an instructor-led mode of teaching and learning to more learner centred approaches, questions, rather than answers play an increasingly primary role in shaping the meta-cognitive development in learners as they explore and make meaning in collaborative settings. "Meta cognition" in this context refers to the idea of an individual being aware of and understanding their own mental (cognitive) processes and ways of learning. For students to work metacognitively therefore means that they take active control of the processes involved in learning and

thinking as they are happening. A feature of this approach is its emphasis on solving real problems. Students need opportunities to hypothesise, think aloud, and make guesses in response to the challenge of solving real life problems. These could be difficulties which all students have encountered and requires creative and/or lateral thinking. This presumes that teaching is moving away from the didactic model where the teacher imparts knowledge through elicitation or explanation to a more interactive approach to learning where students use prior knowledge and experience to make links to new learning through a collaborative, problem solving style of teaching ie questioning and discussion. As I wrestle with the demands of a prescribed curriculum, Qualifying to Teach, (TTA 2002)) which has to be taught within a prescribed time frame (1 year) this shift in teaching strategy is at the heart of my study. By focusing on the content of the curriculum which has to be covered, I have become aware that elicitation can become my dominant teaching style. In the feedback comments from my peer observation (appendix v), my use of "teaching objectives" rather than "learning objectives" was highlighted as an indication of how I was focusing on what I was doing at the expense of communicating to students what they would be doing and learning.

Gall (1984) in his article "Synthesis of Research on Teachers' Questioning" considered some similar issues. Because questions occur so frequently in classroom teaching he began to consider their effects on students and asked whether questions helped students learn the curriculum and whether they promoted the development of

thinking skills. He also critically explored whether some questioning practices were more effective than others. The outcomes from this interrogation were that:

- teachers' questions that require students to think independently and those that require recall of information are both useful but serve different purposes.
- improving the quality of teachers' questions is not sufficient. Students also need to learn the response requirements of different types of questions
- teacher acceptance of student ideas is positively correlated with student learning

Anning (1994) and Moyles (1989) similarly argue that asking a certain type of question can be, or not be a means of extending students' learning and developing an interactive style of teaching. Interactive teaching being that which involves an increased interchange between tutor, students and the lecture content (Steinert & Snell 1999). Steinert & Snell (1999) believe that the use of interactive lectures can promote *active learning*, heighten attention and motivation, give feedback to the tutor and the student, about the learning and about their learning, and increase satisfaction for both. In the context of the classroom the major characteristics they associated with *active learning* strategies include:

- Students being involved in more than passive listening
- Students being engaged in activities (eg reading, writing, discussing)
- Less emphasis being placed on information transmission and greater emphasis placed on developing student skills
- Greater emphasis being placed on the exploration of attitudes and values

- An increase in student motivation
- Students receiving immediate feedback from their teacher
- Students being involved in higher order thinking (analysis, synthesis and evaluation)

In summary, in the context of the classroom, *active learning* involves students in doing things and thinking about the things they are doing. This notion of active learning is particularly important because educational research (Butler, 1992; Feden, 1994; Kraft, 1985; Murray, 1991) has shown that students who are actively involved in the learning activity will learn more than students who are passive recipients of knowledge. Adler (1982) reinforced such thinking by positing that all genuine learning is active, not passive. It is a process of discovery in which the student is the main agent, not the teacher. A later piece of research by Erikson (1984, p.3) reinforced Adler's thinking further:

> *Learning is not a spectator sport. Students do not learn much just by sitting in class listening to teachers, memorising pre-packaged assignments and spitting out answers. They must talk about what they are learning, write about it, relate it to past experiences, apply it to their daily lives. They must make what they learn part of themselves.*

How learning occurs

In attempting to understand the relationship between the learning aspects of questioning and the environment in which it is set, I believe that it is imperative to review the predominant theories/ models of learning that prevail. The predominant models of the 20th Century, namely Behaviourism and Constructivism, including Social Constructivism, can be linked to "conventions of interaction". Berk and Winsler's (1996) table can be usefully drawn on to illustrate the Major Relationship

between Learning and Development. The table highlights that interactive teaching and active learning depends on the teacher's perspective on the relationship between learning and development and summarises how the three major learning theories relate to practice.

Perspective	**Description**	**View of student and social environment**	**20th Century Theory**
Learning and development are separate entities	Development is the dominant process; learning follows after it and refines and improves on structures that have already emerged	Active child; so environment refrains from interfering with natural development	Piaget's cognitive-developmental theory
Learning and development are identical	Development results entirely from learning; the social environment provides input, which is absorbed, ready made by children	Passive child; social environment takes full responsibility for development	Behaviourism
Learning leads development	Learning plays a major role in development, leading it forward as children receive instruction from more expert partners on tasks within their zone of proximal development	Active child and active social environment collaborate to produce development	Vygotsky's sociocultural theory

Table 2.1: Major Perspectives on the Relationship between Learning and Development (Berk & Winsler, 1996, pp100-101)

1. Behaviourist model

Pavlov's experiments with animals was developed into classroom based theories by Skinner and Thorndike who emphasised the role of "drills"(reciting tables, conjugations of verbs) and practice (doing more of the same) and pointed to the importance of practice (for example reading over work as part of homework.) As

such, Behaviourism, associated with Skinner and Thorndike, does not appear to place much value on starting from where the student is and using existing knowledge. Indeed it is low on teacher interaction with students, so it has problems as a theory in the context of learning through questioning. Kerry (2002) concludes that "it [Behaviourism] is a way of teaching that has value for certain activities that are suitable for reduction to rote learning, but must be inadequate as a way of furthering learning and stretching intellect." Likewise Pollard (2002) warns that since Behaviourism gives little importance to mental activity, concept formation or understanding, there are difficulties to overcome when setting out beliefs of learning and teaching that depend wholly upon behaviourist approaches.

2 *Constructivist theories*

Constructivist theories suggest that students learn through an interaction between thought and experience. The developmental theory of Jean Piaget is viewed as being 'constructivist' and gives teachers approximate guidance concerning the level of complexity that might be expected in a student's thought processes at approximate stages in their development. The key idea according to Woolfolk (cited in Pollard 2002, p.16) is that "...students actively construct their own knowledge: the mind of the student mediates input from the outside world to determine what the student will learn. Learning is active mental work, not passive reception of teaching." However as the theory has been criticised for linking to a rigid, developmental stages to ages, teachers are advised to avoid making connections with age and stage but rather look at the student and ask "What stage on the model has this student reached?" (Kerry 2002, p69)

3 *Social constructivism*

This theory associated with the Russian psychologist, Lev Vygotsky suggests that not only must we begin from the student but that the social interactions of learning (between student and teacher and between student and student) are also significant factors of learning. Social constructivist theory underpins collaborative classroom working ie group based activities, discussions and so on where the teachers with their questions become the agents for challenging students and taking their thinking on. An extension to Vygotsky's theory is the concept of the "zone of proximal development" (ZPD). Effectively the ZPD implies that students learn incrementally and that through talk with others, with more knowledge, students move towards the development of intellect and the higher cognitive processes. Closely allied to the notion of ZPD is the role of scaffolding. Scaffolding was introduced as a term (a metaphor) by Bruner (1985) to help describe the notion of "good tutoring" of learners through structured and meta cognitive processes that the students can then enact by themselves in any context. When scaffolding, the teacher models desired behaviours and helps mediate gaps in pupils 'communication and differences in perceptions and opinion (Wood, Bruner & Ross1976; Vygotsky 1978). The notion of scaffolding puts questioning at the heart of the process. Indeed Bruner (1986) concluded that scaffolding only occurs as a result of a question being posed by the teacher that then allows the student to move up into a higher cognitive zone. Furthermore, Pollard (2002) argues that questioning can scaffold learning to become a form of classroom interaction for the development of rapport and trust rather than a tool to evaluate and assess content knowledge. Pollard (2002) goes on to claim that

this entails more than the tutor learning to ask good questions to trigger deep learning; but that students need to learn the "psycho-social" and "pedagogic role" of questions and how they reflect a learning community. Linked to this argument is the way in which teachers ask questions, not just what questions to ask. How to ask questions as well as what questions to ask in order to sustain a learning environment where students do not feel threatened is a crucial factor in evaluating the benefits of a questioning approach to learning and teaching. Morgan and Saxton (1991) give several reasons for why teachers ask questions, these being

- The act of asking questions helps teachers keep students actively involved in lessons;
- While answering questions, students have the opportunity to openly express their ideas and thoughts;
- Questioning students enables other students to hear explanations of the material by their colleagues;
- Asking questions helps teachers to pace their lessons and moderate student behaviour; and
- Questioning students helps teachers to evaluate student's learning and revise their lessons as necessary.

Unfortunately, although the act of asking questions has therefore the potential to greatly facilitate the learning process, it can also have the capacity to turn a student *off learning* if done incorrectly. As such the attitudes, behaviour and the interpersonal skills of the teacher will determine the success of a questioning approach. Students must feel free to ask and answer questions without the fear of an

adverse response, if he or she should provide an incorrect answer. If students perceive negative behaviour on the part of the teacher the benefits to students of this questioning approach to interactive teaching, it is argued, will be lost as students may withdraw from the process. How questions are asked and how teachers respond to answers within the classroom will be discussed in more detail later.

The changing role of the teacher

A traditional role of the teacher can be described as one who dispenses knowledge, one who transmits information, communicates with individuals, directs student actions, explains conceptual relationships. The teacher as a facilitator is one who helps students process information, models the learning process, communicates with groups, facilitates student thinking and guides student actions. According to Anderson (1999) there are many benefits of an inquiry based classroom ie where the teacher is a facilitator, to that of traditional pedagogy, where the teacher imparts knowledge. The outcomes for the learner, from the teacher as a facilitator approach, can be such that the student directs his/her own learning, that tasks vary among students and that students design and direct their own tasks, and that there is an emphasis on reasoning, reading and writing for meaning, solving problems, building from existing cognitive structures and explaining complex problems. This approach to learning and teaching is an ambitious attempt to make students' education more transferable to situations beyond the specific context of the lesson, and more conducive to lifelong learning. Students in this interactive environment may then have a greater opportunity to become real thinkers, puzzle through problems, see multiple ways of finding solutions, gather and weigh evidence, and apply and test

out ideas. The ability to ask and answer questions therefore becomes central to learning. But application of theory to practice is not straight forward.

Types of questions

Inextricably linked to what has been discussed so far are different perspectives on learning. Wilen (1987) asserts that the types of questions that teachers ask, and the techniques and strategies they employ can make the difference between reflective, active learners and parroting, passive learners. Other studies in education (Gage and Berliner, 1991; Mannison et al.; Meyers & Jones, 1993) have found that increased attention and motivation can enhance memory, therefore the types of questions asked are crucial to learning. Indeed some researchers have emphasised that increased arousal and motivation are *the* essential ingredients for learning. Attention span studies have shown that students' interest and concentration in the traditional lecture, where the tutor relies on elicitation, diminishes significantly after 20 minutes (Fredrick, 1986; Foley & Smilansky, 1980.) In addition to increasing student involvement, attention and motivation, interactive teaching through the use of questioning, can promote a "higher level" of thinking. powerful argument can therefore be made for incorporating a variety of types of questions some of which should arouse interest and attention. However, translating such pedagogic thinking into practice is not easy. A number of obstacles may have to be overcome as there are risks to a questioning approach to learning and teaching. It could be anticipated that students will not participate actively, learn sufficient course content, use higher order thinking skills or enjoy the experience.

Wragg and Brown (1993) categorised four common types of lessons, these being exposition, discussion, skill and investigative. Within each lesson they considered the role of questions and the type of questions used.

- In the exposition lessons questions are used to encourage students to talk about what they know and don't know. However this can sometimes result in questions being used to punctuate a tutor's monologue and there is little genuine dialogue.
- In the discussion lessons there are fewer questions, more spontaneous contributions from students and more student- student exchanges, however they believed that students can sometimes get lost in the learning if tutors lose control. This point will be discussed later when the issue of planning questions is considered. The best examples of discussion led lessons are when tutors use skilful, well chosen, encouraging broad questions to spark off the discussions.
- Within skill learning, ie in the lessons where a new skill is being taught, the researchers identified that teachers need to ask questions about the different phases and processes of learning the new skill.
- In the investigative lessons, questioning strategies needed to vary in accordance with the nature and complexity of the investigation.

Wragg & Brown (1993, p.50) argue that "investigative learning requires the use of a wide variety of thought questions. Among these are speculative questions, evaluative questions and reasoning questions" How teachers use questions in these different types of lessons have a direct correlation to the theories of learning discussed earlier. The relationship of questions and scaffolding to learning can be illustrated by

Watkins et al. (1996, p.43) who explain clearly how scaffolding means more than just helping students to accomplish a task.

> *It begins with the teacher marking out with the pupil(s) a specific line of enquiry, recruiting participants, designing activities tailored to the needs and experience of the group or individual The teacher is aiming at some new level of independent competence on the pupil's part and supports their activities or problem solving, without taking over.*

Gilbert (1997) in her account of classroom research into different strategies to teach primary children drawing identified four strategies as enabling scaffolding. The first she describes as *focusing* which is a question that forms the crucial foundation for discussion. She then *elaborates* by taking on child's answers and extends them. She *praises* and then *synthesises* to draw together the ideas of teacher and child; thus fulfilling the role of the teacher as a scaffold. The teacher as a scaffold and as a questioner can be illustrated further by reference to Gall's (1984) research on teacher questioning. He introduced a 5 step model:

- attend to the question. Research has indicated that by asking a narrow, easily answered question is the best way to engage all learners
- ask the question in a way that it s easy for students to decipher.
- give students sufficient time to think.
- be aware of bias. Boys are more likely to answer questions than girls (Dillon 1982) Teachers of ethnically mixed classes are more likely to address questions to white students (Jackson & Cosca 1974)
- re-direction and probing can have both positive and negative effects.

Intrinsically linked to the types of questions asked is the reason for asking them. For more than two thousand years (since Socrates) the question has been an integral part of teaching. When Socrates defined teaching as "the art of asking questions" he was alluding to the notion of philosophical debating, rather than using questions as a means of testing the memory. The Socratic technique is a teacher directed form of teaching in which questions are used as the sole method of teaching. It consists of the use of systematic questions designed to channel the students' thinking along predetermined paths. The use of questions then in today's classrooms could be an opportunity to transfer the emphasis in learning from the teacher to the student thus the teacher then would be enquiring, probing challenging and the student would be required to think, speculate contribute. However do students learn more when teachers emphasise fact questions or when they emphasise higher cognitive questions? These questions relate clearly to the notion of a reflective practitioner, a term used liberally in teacher education. It is therefore appropriate at this point to consider what is meant by the term "reflection."

There is much research to suggest that it is not easy to reflect. A useful starting point that has relevance for this study is Griffiths and Tann (1992) who proposed the following levels of reflection:

Level 1 *Reflection dealing with action*: instructive, reactive talk, talk that deals with the immediate

Level 2 *reflection that modifies or remedies*: "pause" talk, "wait" talk; the talk of modification and re adjustment-"let's think again" talk

Level 3 *reflection on action*: reshaping and reviewing; interpersonal talk- dialogue, discussion, questions to promote reflection; talk to produce agreed, shared modifications to action on proposed actions

Level 4 *reflection as planned, with a focus*: systematic, research activity with a sense of purpose; talk of sharply focused observation; talk of data, evidence and the justification of ideas and beliefs; talk related to judgements by action

Level 5 *profound reflection that produces personal meaning*: reflection that generates new ideas, strategies and personal theories; "analysing" talk, "evaluative" talk related to producing new ideas and solutions.

Drawing on this work, I believe, that much of reflective learning is based on thought questions, so it is important for tutors to think about this type of questioning if we wish the students to develop their reflective learning skills.

Levels of questions

Stevens' observations of teacher questioning in 1912 found that teachers asked 395 questions a day, with two thirds of the questions asked requiring students to do nothing more than to recall information. Nearly a century later and after further research aimed at teachers' use of questioning the findings overall show that nothing much has changed. For example Pate and Brener's research (1967) asked teachers to give their reasons for asking questions. They found the most common reason was to check knowledge and understanding, which was followed by questioning which diagnosed students' difficulties and required them to recall facts. Only 10% of the sample (no size of sample given) stressed the use of questions to encourage students to think. It has been calculated that since most teachers ask an average of 43.6 questions per teaching hour, in an average career they are likely to ask between 1.5 and 2 million questions. Jackson (cited in Wragg, 1993) concluded that teachers can engage in over 1,000 interpersonal interactions in a single day. In fact, teacher questions constitute a tenth to a sixth of all classroom interaction time (Dunkin &

Biddle 1974). It is pertinent therefore to examine not only the reasons for asking questions but to consider the types of questions and how and when they are asked. Gall (1970) reviewed the literature on teacher classroom questions. His findings showed that 60% were low level recall questions, 20% were procedural and only 20% required students to think. According to Wragg (1993), 57% of teachers' questions were related to class management, 35% to information recall and only 8% required a higher order of thinking. Between these two studies (Gall 1970) and (Wragg 1993) a plethora of research projects have been initiated aimed at understanding the relationship between teachers' questioning skills and student attainment.

The lower order and higher order question debate

To summarise so far, questions then can serve many purposes in the learning and teaching context. They can help students reflect on information and commit it to memory, they can be used as a management tool to draw students into the lesson and keep them focused and they can develop thinking skills, encourage discussion and creativity. How questions are categorised will influence any findings on the use of questioning to promote thinking and learning. They are often categorised into lower order questions and higher order questions, but is one better than the other? The most thoroughly investigated issue in questioning research is whether it is more effective for teachers to emphasise higher-cognitive questions or lower-cognitive questions in their teaching. Wilen (1991) argues that teachers spend most of their time asking low-level cognitive questions. Ellis (1993) claims that may teachers **do** rely on low level cognitive questions in order to avoid a slow-paced lesson, keep the

attention of students and maintain control of the classroom. According to Cohen et al. (1996, p.231)

> *Lower-order cognitive questions embrace chiefly recall, comprehension and application; higher order questions, by contrast, involve analysis, synthesis and evaluation. Lower order questions tend to be closed questions...higher order questions tend to be open...*"

High level questions then can be defined as questions that require students to use higher order thinking or reasoning skills. They are therefore likely to provide rich and varied learning contexts for the development of thinking and reasoning skills. Kerry's study in 1989 of secondary school lessons found that only 4% of questions were of the higher order nature. I believe an effective way to replace lower order questioning with critical thinking questions (higher order questions) is to use Bloom's Taxonomy of Thinking framework (1956). A summary of this is given below:

6	Evaluation	Students must use the specific criteria to assess situations or to justify previous responses
5	Synthesis	Students must hypothesise, predict and use the available information to arrive at a generalisation-putting together new elements or parts from many sources to constitute a new pattern or structure
4	Analysis	Students must break down material into its component parts and then use a systematic process to reach a logical conclusion
3	Application	Students must use an abstraction (principle or theory) brought from other experiences. It requires that students apply previously learned knowledge and skills to new situations and necessitates the use of abstractions in specific situations
2	Comprehension	Students must explain topics, review items, and discuss issues; this includes translation, interpretation, extrapolation, and focuses on the meaning and intent of the material
1	Knowledge	Students are required to recall the information learned and repeat it to the teacher

Lowest

Bloom (1956) suggests that students need to have **knowledge** before they can understand it and that they need to **understand** it before they can apply it in different contexts. They need to be able to handle these "lower order" skills (knowledge, comprehension, application) before they can **analyse** and **criticise**. This is necessary before they can combine different kinds of knowledge to create new understandings, (**synthesis**) after which they can move onto **evaluate**, the "highest order. Moving between these stages demands increasingly complex thinking by the student. Sullivan (2003) uses the steps in Bloom's Taxonomy to create the table below as a way of illustrating how a teacher can use questions as a scaffold to develop students' thinking so that the questions make increasingly challenging demands on the students, see following table:

	What students need to do	**Examples of possible question structures**
Evaluation	Assess, judge, evaluate	Which was the better strategy to use?
Synthesis	Design, create, compose, reorganise, speculate, hypothesise, summarise	What ways could you test that?
Analysis	Analyse, infer, prioritise, reason logically draw conclusion	What assumptions are being made...?
Application	Demonstrate how, solve, use, relate, apply ideas	What do you think will happen next? Can you use what you know now to solve the problem?
Comprehension	Translate, predict, explain, compare, classify	Explain what is happening...? What are the key features?
Knowledge	Define, recall, describe, label, identify, match, name	What is it called? When did it happen?

In summary management, recall and simple comprehension were classified as lower order questions while application, analytical questions which required synthesis and

evaluation were classified as higher order questions. Teachers' questions are thus capable of provoking either low or higher order thinking in students. Dantonio and Beisenherz (2001) in their text *Learning to Question, Questioning to Learn* analyse the higher level versus lower level questioning research findings. They alert the reader to the work of Rosenshine (1971) who concluded that students learn best when teachers use lower- level questions such as those which require students to recall facts. The same authors also make reference to the claims in research by Redfields and Rousseau (1981) who argued that "the predominate use of higher level questions during instruction has a positive effect on student achievement." An article by Winne (1979, p.46) in which he reviewed eighteen research papers to summarise the evidence about the effects of teacher higher cognitive questions versus fact questions, on student achievement, came to the following conclusion;" There is **no** sturdy conclusion which can be offered about the relative effectiveness of higher cognitive questions for enhancing student achievement." However by using a different research methodology, Redfield and Rousseau (1981) demonstrated that the methodology for conducting a review of research is a critical variable in determining the outcome and conclusions that will be drawn. Thus the findings of their research, questions Winne's conclusion that teacher questioning behaviour has no effect on student achievement, rather that their analysis demonstrates that **teachers' predominant use of higher cognitive questions has a positive effect on student achievement.** These research findings should be treated with caution if one is to make an overall comment. Redfield and Rousseau's study spanned classes from kindergarten to high school, the work was based in America where the school

curriculum has predominantly lower-cognitive objectives (Goodlad 1983), and Rosenshine's research, (1971) was done on college students who should be able to meet the demands of higher-cognitive questions. Most teachers assume that asking questions can improve student learning.

The purpose of Hunkins (1967; 68) research was to determine whether the variable of question type bears any relationship to student achievement. However his findings must also be treated with caution because of some methodological limitations. For one group, in his study, the questions stressed knowledge; in the other, analysis and evaluation were stressed. Hunkins (1967) found that that the analysis/evaluation group scored higher in terms of achievement than did the students who answered questions that stressed knowledge. However, the recording tools differed, students were asked to write answers initially and on the post training test had only to respond to multiple choice questions, therefore one may question whether the achievement test provided an adequate comparison of the effectiveness of the two experimental conditions. Further studies by Arends 1994 and Wilen 1991 do not reveal any difference in achievement between students whose teachers use mostly high level questions and those whose teachers ask mainly low level questions.

Although much is known about higher cognitive questions and their classification, little is known about what constitutes good answers to these questions. Students' answers therefore maybe the focus for future study. Again the question needs to be asked as to whether we need to develop taxonomies based on what teachers should

ask which are curriculum and subject specific. A further consideration could be that the teacher should consider the needs of the students in order to know which balance between the two types, low and higher order questions, needs to be made in order to foster student understanding and achievement. A later report by Cotton (1988) a US educationist, which examined 37 research projects to do with questioning across the United States, came to two important conclusions. First that a combination of higher order and lower order questions was the most effective method and second that higher cognitive questions appear more productive with older students with average or above average abilities. A note of caution is introduced by Sanders (1966, p. 169)

> *Teachers who strive for higher level questions may lose interest in the bread and butter memory question. They become so intrigued with sending students through intellectual labyrinths that they neglect fundamental knowledge.*

Brown and Edmondson (1984) used a classification system which drew on Bloom's work and on what teachers told them about the kinds of questions they asked. In their research they did however suggest that all classification systems are potentially flawed- and real insight into questioning needs to take into account contextual factors which are too subtle for the classification systems to handle. Gallagher and Aschner's (1963) study on creativity led them to identify five types of questions often found in teaching situations: cognitive-memory, convergent, divergent, evaluative and routine. Their research however indicated that divergent questions, those that seek a variety of possible answers or solutions to a problem, were seldom used by teachers. Wragg (1993) used terms such as *conceptual, empirical* and *value* as ways of categorising questions. Conceptual being concerned with elicitating

ideas, definitions and reasoning; empirical requiring answers based on fact or on experimental findings and value being about relative worth and merit. Other broad categories such as open /closed, recall/thought, confused/clear, encouraging/threatening have been used in case studies. Broon & Atkins (1990, p.69) argued

> *that more important than the particular classifications of questions is an awareness of the range and kind of questions we ask with a group of students. Classifications of questions are context-bound. What may require thought by one student may simply be a matter of recall for another.*

Furthermore Hyman (1979) emphasises that whichever system of classification of questions is used it should be reliable and manageable. He offers the following cognitive categories. The four main types being: Definitional, Empirical, Evaluative, and Metaphysical.

There is no hierarchy intended or implied with Hyman's categories, so, definitional thinking is not a lower order of thinking than empirical and empirical is not lower than evaluative. In fact Hyman believes that Bloom's work on taxonomy of thinking is flawed as Bloom in his later work on the affective domain states that it is not known whether his cognitive "taxonomy" is actually a hierarchical ordering of cognitive objectives or only a simple categorising of cognitive processes with no rank ordering at all. Hyman (1979) recognises that only the first three of the four categories appear in most classrooms with any degree of regularity;

Definitional

1) Questions categorised as definitional are those where we verify the truth by going to a dictionary which reports how the word is used in communication.

Empirical

2) Empirical questions ask you to give responses based on facts and experiences.

Evaluative

3) Questions in the evaluative category ask students to give responses that state their own personal value judgements, they deal with attitudes, feelings, morals, personal beliefs and policies.

Metaphysical

4) Metaphysical questions, ask students to give responses that state their metaphysical or theological beliefs, these questions all involve faith.

Although systems of classification have limitations they do give us some basic insights into what goes on when teachers ask questions.

How to ask questions

Although it is essential that tutors ask questions to bring out the educational goals they are seeking there is more to good questioning than simply asking the proper question. Loughlin (cited in Wilen, 1991) developed the following principles of questioning;

- Distribute questions so that all, including non volunteers, are encouraged to respond
- Balance fact and thought provoking questions,
- Ask both simple and exacting questions,
- Encourage lengthy responses and sustained answers,
- Stimulate critical thinking by asking "To what extent?" "How?" "Why?"
- Use the pause technique,

- Ensure audibility,
- Personalise questions
- Suggest partnership eg "How can we...?"

Loughlin's first principle can present a dilemma for teachers. In a typical teaching session with 20-30 students each student will only be able to respond a small percentage of the time. If students are not actively engaged then there is a risk that they will go off task. Using individual names rather than directing questions at the whole class could be one way of encouraging non volunteers. Gersten et al. (cited in Wilen, 1991) found that it was more effective for teachers of low attaining students to address questions to the class as a whole whereas Gall (1978) found that it was more effective for teachers of high attaining students to address a question to specific student

Broon and Atkins (1990) argued that if we wanted to ask questions which got students thinking then we had to think about the questions we were going to ask. Such thinking is pertinent to this study. I believe, drawing on personal experience, I do not always prepare my questions but expect them to arise spontaneously. Hyman (1979) recommends careful planning of questions in a session, writing them out to make them clear, precise, short, relevant and understandable. Dillon (1983, p.8) also recommends careful preparation of the questions to be used and argues that "To conceive an educative question requires thought; to formulate it requires labour; and to pose it requires tact." However, Hyman (1979, p.22) heeds a warning

> *Teachers need a strategy for asking questions simply because with a strategy they have a framework within which to determine the questions they will ask...Even with careful and comprehensive planning no teacher*

can – or should – know ahead of time exactly which questions to ask at a given moment.

The feedback from my peer observation (appendix v) highlighted the planning and preparation of questions to be both a strength and an area for development. Drawing on the work of Hyman (1979) my peer observer recommended that by planning open ended activities, such activities may lead to more unpredictable learning but that the learning could be "the most exciting and memorable."

How to ask questions is as important as the type of question to ask. Wragg (1993, p.27) draws on the work of Confucius when he describes a good teacher as one who "guides students, not pulls them along, urges them to go forward without suppressing them, shows the way without taking them to the place." Cowan (1998) also argues that by guiding students in their learning through questioning will lead directly to progress as far as their learning is concerned.

Wragg's (1993) research on questioning found that out of more than a thousand questions analysed 50% stood alone, 47% were part of a sequence of 2 or more questions, and only 10% of questions asked were in a sequence of more than four questions. Asking questions as part of a sequence can encourage students to complete or clarify a response, adding further information. It can also be used to extend thinking by having students provide support for a given point of view. A critical factor in the effectiveness of follow on questions is that subsequent questions should be asked in a supportive, inviting manner in order to avoid placing students in a threatening or intimidating situation.

Just as Tobin & Capie (1980) argue the effect of "wait time" as a crucial element in the effective use of questioning so Dillon (1979, 1981, 1983) suggests deliberate silence is an alternative to further questioning. He goes on to suggest that where a student has ostensibly finished speaking the teacher may instead of asking another question choose to:

- Make a declarative statement
- Make a reflective restatement
- Describe his or her state of mind
- Invite the student to elaborate further
- Encourage the student to ask a question
- Encourage other students to ask a question
- Maintain deliberative, appreciative silence (until the student resumes or another enters the discussion.

Used together these various alternatives could foster students' cognitive, affective and expressive processes during the discussion. From the analysis of a case study (Dillon 1988) on the use of the alternatives to follow up questions the findings showed that there was more and better discussions: more student talk, more student-student references, more students participating more exploration, speculation and more student questions.

From the literature it can be argued that questions are better than no questions. But can one ask too many questions? Rosenshine (1986) concluded in his review of research on questioning that more questions may be better than fewer questions.

Conversely Dillon (1988) argues that excessive questioning makes students feel dependent and passive. Furthermore Anderson (1999) found from her research that students often found questioning stressful and a cause of anxiety. This is something which I alluded to as part of my introduction and is a feature of the discussion I have with the students as part of my methodology. Brown and Wragg (1993 cited in Kerry 2002)) remind the reader that the use of questioning is just one of the many teaching skills and must be handled like other learning and teaching strategies as its effects could be interpreted in a negative way by the student as illustrated,

> *A five year old girl returned from her first day at school and announced that her teacher was no good because she didn't know anything. When asked why she thought that, the child replied that her teacher "kept asking us things"*

It is important to consider not only the types of questions but also the tactics involved in asking them. These tactics, according to Wragg (1993) include *structuring, pitching, directing, pausing, prompting, listening* and *sequencing.* Sometimes *structuring* moves are described as "preformulators" and take the form of the teacher telling the students "this is what we are going to do", so the teacher builds on existing knowledge and experience. *Pitching* is about estimating the right intellectual level of the people you are questioning, so that the students are not bewildered or feel patronised. *Directing* or distributing questions around the group ie not always asking the ones with hands up, demonstrates inclusive practice as does using names or non verbal gestures such as a head movement or facial expressions. Wragg (1993) highlighted the work of Rowe (1978) when using the term *pausing* to describe the effects of waiting time. He suggests the tactic of *prompting* and follow up questions to probe more precise and detailed answers. Bloom & Atkins (1990) expanded on the

tactic of questioning related to prompting by introducing the implicit question; this being when the tutor does not ask a question directly; instead he or she makes a comment which students are expected to connect with what is being discussed. The importance of *listening* to answers and not being too focused on the questions is also highlighted as an important strategy. Wragg's final tactic is *sequencing,* that subtle art of planning a sequence of learning based on key questions. Much has been written about how to ask questions effectively and from the research common errors in questioning can be deduced. The following figure produced by Broon and Atkins (1990 p73 *Figure 4.10*) summarises the most common errors noted in the research.

- Asking too many questions at once
- Asking a question and answering it yourself
- Asking questions only of the brightest or most likeable
- Asking a question too early
- Asking irrelevant questions
- Always asking the same type of questions
- Asking questions in a threatening way
- Not indicating a change in the type of question
- Not using probing questions
- Not giving time to think
- Not correcting wrong answers
- Ignoring answers
- Failing to see the implications of answers
- Failing to build on answers

On reading the literature it would appear that responding to questions is the linchpin of questioning. Wragg (1993) and Rowe (1978) both highlight the role of "wait time" as a means to improve the quality of responses. Most questions are answered in less than a second, (Rowe 1974). That is the average time teachers allow between posing a question and accepting an answer. The typical teacher pauses for approximately 1 second after asking a question before calling on a student for a

response. He/She then pauses for 1 second after a student has responded before probing the response, redirecting the question to another student, rephrasing the question, or answering the original question. Swift and Goodings (1983) found that as teachers increased their pauses to 3 seconds the quantity and quality of students' responses increased significantly. Teachers' increased use of wait time caused more students to respond, give longer responses and to ask a greater number of higher cognitive level questions. Therefore one can deduce that teachers who increase wait time consistently as a questioning technique increase the probability of their students' achievement gains. Similarly Hastings' (2004) research found that increasing the wait time improves the number and quality of responses, 3 seconds for a lower order question and more than 10 seconds for a higher order question. A synthesis of studies by Tobin and Capie (1980) confirms the following benefits of "wait time" by teachers:

- The length of student responses increased
- More frequent contributions were made
- An increase in the logical consistency of students' explanations occurred
- Students voluntarily increased the use of evidence to support inferences
- The incidence of speculative response increased,
- The number of questions asked by students increased
- Greater participation by all learners occurred.

The research seems to suggest that having the self discipline to keep quiet or setting a question at the end of a session will allow students time to think and organise their thoughts. This strategy of giving thinking time may also prevent the teacher from

changing the question, answering the question him/herself or only seeking answers from the "brighter" students. Wait time can also change a teacher's expectations about what some students can do and know. It may also put the student into a more active role, realising that learning depends on their readiness to express and discuss, not just on spotting the right answers. The emphasis moves from the teacher presenting material to him/her to framing questions to explore issues, critical to the development of students' understanding. "Wait time" can therefore change the social control pattern in the classroom. As teachers increase "wait time" Mishler (1975) and Dillon (1982) argue that students feel more in control of their behaviour and they feel that the teacher is more interested in their ideas than in testing their ability to remember facts.

In Broon & Atkins' (1990) list of common errors they make reference to the timing of questioning in a session. Wilen (1987) raises the question "Is it more effective to ask questions before, during or after instruction?" He concludes that questions can be effective at all three phases, however he states that the function of questions in each phase is different. Questions asked before instruction usually take the form of "What do you already know...? Questions can be used during instruction to check students' understanding. Questions after instruction usually take the form of rapid question-answer exchanges which may help students reflect and digest on their learning.

The effects of questions on students, attitudes

An area for which there is little research is that of the effects of questioning on student attitudes. From Cotton's (1988) findings drawn from thirty seven research documents, the only conclusions emerging are that the cognitive level of questions posed is unrelated to students' attitudes towards the subject matter. Hastings' (2004) research refers to work by Ian Mitchell in Melbourne Australia on children's attitudes to questioning. He found that children's main fear is not of answering a question incorrectly but of saying something that will be ridiculed by the teacher or other pupils. "Peer fear" is the main obstacle to children asking and answering questions. Clearly teachers can use questions both to embarrass and to empower. A further detrimental effect of questioning was found by Martin (1979) who agued that as a teacher increased the use of higher cognitive questions so students' higher order responses increased accordingly, however, unfortunately, according to Martin (1979), students also became more negative in their attitude towards the teacher. This shift in attitude, he concluded, was a result of the greater effort required by students to answer the questions.

From this literature research it can be deduced that questioning is one of the most popular modes of teaching. Hyman (1979, p.xiii) reminds us that

> *Though teacher questions are central and essential to teaching, they are not necessarily the most important behaviour in any given teaching situation. Teachers do perform other critical acts as well. We ought not to lose sight of this for then we might forget the larger context of teaching.*

The transfer of factual knowledge and conceptual understanding can be achieved through questioning as well as through other teaching strategies. However although

the act of asking questions has the potential to facilitate the learning process it also has the capacity to turn a student off learning if done incorrectly. The purpose of this review has been to consider what types of questions and questioning behaviours can facilitate the learning process. Postman & Weingartner (1971) argue that the ability to identify and ask good questions is the best measure of the quality of someone's education. The literature confirms that the art of question planning can result in designing questions that can expand students' knowledge and encourage them to be critical and creative thinkers. The educational philosopher, Schleffler (1973) sees questioning as the key means by which students can become critical thinkers, learn to reason and learn to be reasonable. Therefore effective questioning strategies and techniques are important elements in a teacher's repertoire of teaching skills.

This review has not considered the role of student questioning. Student directed questioning strategies in classroom discussions are a potentially fruitful and needed area of future research. A teacher's encouragement of student initiated questions during discussions has the potential to shift more control of the discussion and the responsibility for significant on-task thinking to students. The outcome is that students may begin to assume more direction for their own leaning. This aspect of questioning is for a future study

Summarising thoughts

The information from this review of literature is intended to provide encouragement and direction to any teacher or teacher educator for whom developing and upgrading questioning skills is an area of potential interest. The techniques used to research

how to improve questioning are not ends in themselves; just as questioning is not an end in itself. My aim is to help myself teach better, use questions to increase students' verbal participation so that my students' learning will profit. From this literature research I now have a clear focus, rationale and structure for my own research. 1) How students perceive my use of questions as a tool for their learning and 2) How I use questions as an interactive teaching tool will be analysed through the research methods and tools I have adopted. I believe that through my reading and from my research findings I will have a sound basis to develop and change my questioning behaviour and so become more effective in stimulating interaction in the classroom. By expanding my repertoire of questioning techniques in my teaching, students and ultimately colleagues should be encouraged to apply these skills in their own classrooms.

Chapter 3

Methodology and methods

Introduction

Man is the fate of man

To observe
You must learn to compare
To be able to compare
You must have observed already
From observation comes knowledge
But knowledge is needed to observe
He who does not know
What to make of his observation
Will observe badly
The fruit grower will look at the apple tree
With a keener eye than the strolling walker
But only he who knows that the fate
Of man is man
Can see his fellow men keenly with accuracy

(Brecht, 1934 cited in Rush 2002)

The above quotation describes very well the process I have gone through when carrying out the focus of this research. Very often the act of researching is depicted as a linear, logical sequence: identification of research aim, planning of investigation, data collection, data analysis, interpretation and discussion of data, conclusions arrived at and the writing up. But in reality it is a "mixture of guesswork and checkwork." (Medawar, 1963, cited in Wellington, 2000, p.10). Wellington (2000) argues that all research must have some kind of starting point – a hypothesis to test out or the formulation of research questions. He suggests that a slightly less focused starting point might for example be an *issue* to be explored.

The latter was the case for me, namely a study on the use of questions within the P.D.E. course on the P.G.C.E. E.Y. programme.

As I am the subject of the research, careful thought needs to be given to the mode of enquiry. From the outset I am accepting involvement and as such bias as inevitable. The literature review highlighted a number of issues to be explored to do with researching what types of questions and questioning behaviours can facilitate the learning process on the P.G.C.E. E.Y. programme of study, and in particular on the Professional Development Education (P.DE.) course. In this chapter I will critically explore the methodology and methods which will best fit the pursuit two questions in relation to the overall research focus; namely

1. How do students perceive my use of questions as a tool for learning?
2. How am I currently using questions as a way of promoting an interactive teaching strategy

Theoretical underpinning of research

Hammersley (2002) argues that there are different forms of research that are carried out for different purposes. For example Manstead and Semin (1988) make the obvious but often neglected point that the strategies and tactics one selects in carrying out a piece of research depend very much on the type of research questions one is trying to answer or the hypothesis under scrutiny. Indeed approaches to research methods vary enormously. That said, two main traditions would seem to prevail. One is variously labelled as positivistic, natural – science based and quantitative; the other as interpretivist, ethnographic or qualitative.

According to Cook and Richard (1979) quantitative research usually uses statistical techniques such as multi statistical analysis and randomised quasi experiments. Theories are tested by means of standardised procedures and experimental methods. This statistical approach gives emphasis to sampling procedures, as in survey research, and there is a concern to establish the reliability of measurement techniques (Hardman. 1994). Conversely qualitative methods use ethnographical case studies, interviews and participant observations. Within such a paradigm Hammersley (2002, p.2) argues

> *The ethnographer participates, overtly or covertly, in people's daily lives for an extended period of time, watching what happens, listening to what is said, asking questions; in fact collecting whatever data are available to throw light on the issues with which he or she is concerned.*

Drawing on the wider literature, a common approach to quantitative research involves five sequential steps, these being:

1 Deducing a hypothesis from the theory

2 Expressing the hypothesis in operational terms which propose a relationship between two specific variables

3 Testing this operational hypothesis

4 Examining the specific outcome of the enquiry

5 Modification (if necessary) of the theory in the light of the findings

The major difference of this approach to that of qualitative research is that in the qualitative approach, theories and concepts tend to arise from the enquiry. They come after data collection rather than before it. Bryman (1988) in his text on *Quality and Quantity in Social Research* distinguishes between quantitative and qualitative approaches by defining quantitative research as that which is associated

with the testing of theories whilst qualitative research is associated with the generation of theories. A naïve interpretation of quantitative data suggests that the statistical evidence will justify the research and the naïve use of qualitative methodology produces narrative rather than analysis (Brown and Dowling1998, p.83). Firestone (1987, p.80) tells us that

> *quantitative methods express the assumption of a positivist paradigm which holds that behaviour can be explained through objective facts...[In contrast] Qualitative methods express the assumptions of a phenomenological paradigm that there are multiple realities that are socially defined. Rich description persuades by showing that the researcher was immersed in the setting and giving the reader enough detail to make sense of the situation*

According to the literature there appears to be different views on the weaknesses and merits of the two main research methods, qualitative and quantitative. For example, Greenbank (2002) comments that David Blunkett holds quantitative research in high esteem because of the way its findings are presented, for example through hard data. In my opinion this could be because Governments favour quantitative research as it mimics the research of its own agencies; they want quick answers based on "reliable" variables (Cicourel 1964.) However criticisms of quantitative research can be made. This method of research can amount to a "quick fix", involving little or no contact with people or the "field." Glaser and Strauss (1967, p.7) argue that "while it is important to test hypotheses, a purely statistical logic can make the development of hypotheses a trivial matter and fail to help in generating hypotheses from data." Similarly Miles and Huberman (1994, p.1) argue in favour of qualitative research, that "words, especially organised into incidents or stories, have a concrete, vivid meaningful flavour that often proves far more convincing to a reader- another

researcher, a policy maker, a practitioner – than pages of summarised numbers." Depending on the viewpoint it can be argued then that quantitative research is value free whereas qualitative research is influenced by the researcher's values. The former Chief Inspector for the Office of Standards in Education (OFSTED) Mr. Woodhead described qualitative research as "woolly and simplistic" (cited in Wellington 2000 p.167). Likewise Denzin & Lincoln (1994) referred to qualitative researchers as "soft scientists" and termed their work unscientific, exploratory, personal and full of bias. These comments appear to negate the accuracy and substance of qualitative research. However for the general public there is a mixture of respect and suspicion of quantitative data for example the common used saying, "you can say anything with figures; lies, damn lies and statistics." The table below shows how imprecise, evaluative considerations come into play through the use of the vocabulary when describing qualitative and quantitative methods.

Table 1.1 Claimed features of qualitative and quantitative methods

Qualitative	**Quantitative**
Soft	Hard
Flexible	Fixed
Subjective	Objective
Political	Value-free
Case study	Survey
Speculative	Hypothesis tested
Grounded	Abstract

Source Halfpenny (1979 p799)

The methods used by qualitative researchers exemplify a common belief that they can provide a "deeper" understanding of social phenomena which could not be obtained from purely quantitative data. For example qualitative researchers are seen by Hammersley (2002) to share a set of preferences, these being

- A preference for analysing words and images rather than numbers
- A preference for using observations rather than experiment,
- A preference for using unstructured interviews to structured ones
- A preference for hypothesis-generating research rather than hypothesis testing.

Bryman (1988) described the quantitative researcher as having preferences for social surveys, experiments, official statistics, structured observation and analysing content.

Accepting that both quantitative and qualitative approaches have strengths and weaknesses, Firestone (1987) and Hammersley (2002) believe that the two methodologies, quantitative and qualitative, can actually be complementary. However, this assertion is at odds with Smith and Heshusius (cited in Hammersley 2002) who claim that quantitative and qualitative approaches are fundamentally at odds with each other. Regardless, for the purpose of my research I am adopting a combination of methodologies. In choosing to do so I am in agreement with Burton and Bartlett (2005 p. 28) who argue that "in order to produce a more thorough and rigorous piece of research, several research methods are often used in conjunction with each other." The approach adopted and the methods of data collection selected will depend on the nature of the inquiry and the type of information required. For the purpose of my research an "action research" approach will be adopted.

Action Research

My choice of action research has been influenced by Stenhouse (1979) who stresses that action research should contribute not only to practice but to a "theory of education and teaching which is accessible to other teachers"

The literature suggests that with action research,

> *You don't have to begin with a problem. All you need is a general idea that something might be improved. Your general idea might stem from a promising new idea or a recognition that existing practice falls short of aspiration. In either case you must centre on: what is happening now? In what sense is it problematic? What can I do about it?*
> (Hopkins 1986, p.46)

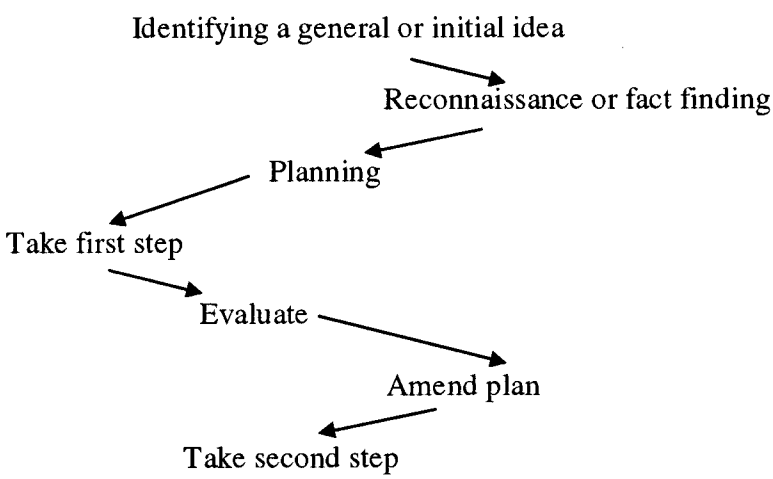
This interpretation of action research fits with the overall aim of my research. Questioning has not been identified as an area of concern, however the use of questions to promote thinking is a belief I hold when working with young children; as such I am interested in critically exploring the transference of such a teaching strategy across to my work with students on the P.G.C.E. E.Y. programme.

The social psychologist Lewin (1952) first coined the phrase "Action Research" and described the process in terms of planning, fact finding and execution. He was concerned with changing attitudes and behaviour and his suggestions were quickly adopted by educationists who saw the value of involving practitioners. This has been interpreted by researchers Carter and Halsall (cited in Burton & Bartlett 2005) as promoting a rigid approach to research and for assuming that the research begins with "a management issue" that is wrong or needs to be fixed. It is because of this interpretation that Hopkins (2002) uses the phrase "classroom research by teachers"

and Carter and Halsall (1998) "teacher research." Bell (1987, p.6) points out that Action Research is not a method or technique but

> *An approach which has proved particularly attractive to educators because of its practical problem solving emphasis, because practitioners carry out the research and it is directed towards greater understanding and improvement of practice*

McNiff (2002) and (Elliott 1991) argue that there have been many diagrams used to illustrate Action Research. For example, Lewin (1952) saw Action Research as a self reflecting spiral of cycles of planning, acting, observing and reflecting then re-planning, further action further observation and further reflection.



The approach as presented above does show a spiral movement however the approach does take a fairly sequential form and I believe it does place insufficient emphasis on analysis at key points. Therefore there is a danger of this method becoming little more than a procedure. McNiff's (2002) original Action Research spiral had 3 spirals of action and observation and between each there were periods for planning and reflection. A belief by Carr and Kemmis (1986) is that the "action" movement of the cycle is a probe into the future and that if what is learned

is not fed back to modify plans, effect implementation of them and stimulate monitoring of new action with still further reflection then it is not Action Research. Carr & Kemmis (1986) asserted that the feedback loop is only a beginning and if the process stops then this might be termed "Arrested Action Research". Grundy and Kemmis (1981) further maintained that there are two essential aims of all Action Research activity these being to improve and to involve. This draws on Stenhouses' (1979 cited in Elliott 1991) earlier work when he suggested that Action Research should contribute not only to practice but to the theory of education and teaching which is accessible to other teachers, making educational practice more reflective. It is not an end in itself, but a means of developing a teaching philosophy and strategy, and involves teachers learning about others and themselves through 'research' into their own practice. This puts reflexivity central to Action Research.

From the outset I am intending that my action research will result in an improvement in practice and a greater understanding of myself and the situation in which I practise ie teaching P.D.E. on the P.G.C.E. E.Y. programme. Via my small- scale action research I aim not only to improve practice through my use of questions but to increase awareness and professional competence through self development and expand my educational knowledge. The use of action research is appropriate in any context when: "specific knowledge is required for a specific problem in a specific situation or when a new approach is to be grafted on to an existing system" (Cohen & Manion 1980, p.181). Closely aligned to my use of action research will be the use of case study.

Case study

Burton & Bartlett (2005, p.85.) argue that "The case study approach is not a methodology as such but a research strategy where the researcher aims to study one case in depth." Robson (1993, p.53) concurs with this and emphasises the distinction between methodology and strategy when he describes the case study as "a strategy for doing research which involves an empirical investigation of a particular contemporary phenomenon within its real life context using multiple sources of evidence." The term "case study" will be used despite Miles and Huberman (1984) preferring to use the term "site" rather than "case." The former term, I believe, carries a strong geographical flavour rather than the desired human one. Case study in the field of research has been described as a kind of "soft option" (Campbell and Stanley 1963). Furthermore Nisbet and Watt (1980, p.8) do not even consider it as research in that it is "thought to require artistic or literary skills, in contrast to true research which was thought to depend on skills of numeracy and statistical analysis". However Campbell appears to have adjusted his views slightly when in 1979 he subsequently described "case study" as a fully legitimate alternative to experimentation. Nisbet and Watt's (1984) argue the strengths and weaknesses of "case study". To summarise, they argue the use of case study is strong in that:

- Results are more easily understood by a wide audience as they are often written in everyday language, they capture unique features which may be lost in larger scale or numerical data,
- Results are strong on reality

- Case studies can be undertaken by a single researcher

The weaknesses are summarised as:

- Results not easily open to cross checking, therefore may be personal and subjective
- Results are prone to problems of observer bias
- Results may be seen as being too generalised

One of the possible advantages of a case study according to Adelman (cited in Carr, 1989) which is particularly pertinent to the aim of my research is that case studies are a "step to action". Their insights may be directly interpreted and put to use; for staff or individual self-development, for within institutional feedback; for formative evaluation and in educational policy making. Similarly Cohen, Mannion & Morrison (2000, p.181) argue that "case studies can penetrate situations in ways that are not always susceptible to numerical analysis." Burton and Bartlett (2005) take the view that a case study approach may lack representation from a wider field. In the case of my research this can be viewed as a justified argument due to the central focus of the study being myself. Like any other research method, case study has to consider validity and reliability, both of these issues will be discussed later in this chapter.

Taking into account the strengths and weaknesses of the use of a case study approach I believe, for the purpose of the aim of my research, that this is an appropriate strategy as it enables me to research my use of questioning in my own environment without the need to collect samples from a wider source. Data to support my research will be collected by using several different methods, semi

structured interviews, observations and questionnaire. This will allow for triangulation to take place so increasing the validity of the research. Through the analysis of the data it is expected that greater understanding of my use of questioning will be gained and this will be shared to the wider School of Education community. It is particularly important that I have a secure evidence base to draw any conclusions from the research. As a result of taking the Action Research path based on my use of questioning I will have the feedback from my peer observation and from the subjects ie the P.G.C.E. E.Y. students who will complete a questionnaire and take part in a semi structured interview. The use of action research and that of case study is often associated with ethnography.

Ethnography

Ethnography has become a widely used method in educational research since the 1980s. There have been various attempts to define ethnography. For example, Rist (cited in Robson 1993) described ethnography as being "the research technique of direct observation of human activity in an ongoing naturalistic setting." The intention of an ethnographic study, according to Robson (1993, p.148) "is to provide a rich or 'thick' description which interprets the experiences of people in the group from their own perspective". Walford (2001, p.7) believes that for a study to be called an ethnography, it needs to have each of the following seven elements:

1) A study of culture
2) Multiple methods, diverse forms of data
3) Engagement
4) Researcher as instrument

5) Participant accounts have high status

6) Cycle of hypothesis and theory building

7) Intention and outcome.

In terms of my research, points 1-7 can be interpreted in the following ways. I will be taking account of the cultural and social context of the group that I am researching. The group is a small established group where relationships are positive and mutual respect between members is evident. Furthermore I will be acknowledging myself as the researcher as being part of that which is being researched. Multi methods and diverse forms of data in the form of field notes, questionnaires and audio tapes will be collected. I am anticipating that triangulation of the data collected will give me a multi dimensional appreciation of the setting. As Wood (1994, p. 310) argues, my research will involve me in "engagement in the situation as things actually happen and observing things first hand." This is not to say that this subjectivity will be a weakness but rather that a balance will be struck between suspending preconceptions and using one's own understanding of the situation to enquire intelligently. To assist with objectivity further, a critical and systematic approach will be taken to my interpretation of data and analysis. In the light of the emerging data, any "hunches" or theories that I have will be modified. Ultimately at the end of the research I hope to construct a coherent story which will have positive implications for myself, students and other colleagues in the School of Education.

Research methods

Mindful of the action research, case study, ethnographic approach being taken, I shall take the interpretivist paradigm (qualitative approach). Philips (1993, p. 67) identifies a paradigm as "a framework that determines the concepts that are used and that also contains exemplars, or model inquiries, which direct attention toward some problem as being key and away from other problems or issues regarded (from that perspective) as somewhat trivial." As such, methods such as observations and discussions will be adopted (Hitchcock and Hughes 1995). As a starting point students will be given information about my research and be given the opportunity to participate or withdraw. A letter outlining the nature of the research will be sent to each student and they will be asked to sign a consent section agreeing to participate in the data collecting exercise (appendix i). The maximum sample size will be 15 students and they will be asked to complete a questionnaire at the start of the research period. This will give additional information to the results from the observations and semi structured interviews in a format which will be anonymous and also enable some quantitative data to be analysed. A combination of data collecting tools will therefore be deployed. The essence of this approach is that "the researcher starts with no hypothesis. It requires a particular code of conduct in respect of ethics from the start, and the concern for it should continue through the write up and dissemination" (Verma and Mallick, 1999, p.87).

However as part of the discussion I will be drawing also on the feedback from a peer observation (appendix v). By using a qualitative methodology I will be attempting to:

- Gain a greater understanding and detailed description of how questions are used in my teaching session
- Find out the effects on trainees' learning experience of this form of teaching strategy

I do not perceive that the outcome of the research will be measured in quantitative terms other than the results of the analysis of the questionnaire contributing to the overall findings. My reason for placing an emphasis on the qualitative dimension as opposed to the quantitative dimension concurs with Miles and Huberman (1994, p.10) who argue that "One major feature (well collected qualitative data) is that they focus on naturally occurring, ordinary events in natural settings...another feature is their richness and holism, with strong potential for revealing complexity". As part of my mixed methodology approach I will be using the following data collecting tools.

- **Observation**

Observation will be used as a supportive or supplementary technique of collecting data and it will complement data obtained by other means, such as a questionnaire. Indeed it will be used to corroborate and validate the messages received through interviews as well as the outcome from the questionnaire. Cohen and Manion (1980) argue that there are two principal types of observation – participant observation and

non participant observation. As the participant observer I will be analysing tape recordings of my use of questioning, the very activity I have set out to research. My peer observer will take the role of non participant observer and will sit external to the learning and teaching going on in the classroom. Data will be collected by recording the verbal exchanges between myself and the students by means of a set of observational categories. However participant observation studies are not without their critics and for the purpose of this dissertation methodology chapter are worth noting. Stake (cited in Cohen and Manion 1980) argues that accounts from participant observations are often subjective, impressionistic and biased. Mindful of this issue the use of the tape recorder will provide the evidence so that I do not lose my perspective or become blind to the peculiarities of the research focus. Wragg (1993) recognises the advantages of using tape recordings as it enables the researcher to replay the recording several times for discussion, analysis and corroboration with other data. He also acknowledges the disadvantages of this methodology, such as there being a loss of important visual clues such as facial expressions, body language and movement. Being a member of the group that is being observed carries advantages and disadvantages. My knowledge of the group is extensive and because of this there is the problem of achieving objectivity.

- **Questionnaire**

An ideal questionnaire posses the same properties as a good law:

> *"it is clear, unambiguous and uniformly workable. Its design must minimize potential errors from respondents ... and since people's participation in surveys is voluntary, a questionnaire has to help in engaging their interest,*

encouraging their co-operation, and elicitating answers as close as possible to the truth"
Davison (cited in Cohen & Manion1980, p.106)

Self completed questionnaires are very efficient in terms of research time and effort however Robson (1993) argues that the data can be superficial and there is no check on honesty of responses; also while analysis may be easy, interpretation may be problematic. The following suggestions arise from the research literature:

- Specific questions are better than general ones
- Closed questions are usually preferable to open questions
- Offer a "no opinion" option
- Omit the middle alternative and measure intensity

(Robson 1993, Converse and Presses,1986)

Cohen & Manion (1980) also argue that they should avoid "highbrow questions", "irritating instructions" and "leading questions." Cohen & Manion (1980) and Bell (1987) emphasise the importance of the covering letter which indicates to the respondents the aim of the study, its importance and to assure them of confidentiality. Kane (1987) also advocates that the letter should state how the respondent was selected and an appeal for co-operation. The literature recommends the use of a follow up letter to encourage respondents to return the questionnaire. The questionnaire used in my research took account of the literature on designing questionnaires and as the "target group" was known personally there was an accompanying letter which allowed students to opt out of the research study completely.

- **Interviews**

Robson (1993) suggests that interviews lend themselves well to be used in combination with other methods, in a multi-method approach. The definition of the term "semi structured interviews" ie that of being an interview where the interviewer has clearly defined purposes, but seeks to achieve them through some flexibility in wording and in the order of presentation of questions, will be adopted. Face to face interviews, I believe , can be a powerful tool, though not without its problems. Powney and Watts (1987) describe interviews as a conversation however Cannel and Kahn as cited in Cohen and Manion (1989, p.307) argue that it is much more, it is "initiated by the interviewer for the specific purpose of obtaining research relevant information and focused by him on content specified by research objectives of systematic description, prediction or explanation." Face to face interviews, although time consuming offer the researcher opportunities to follow up interesting responses, modify the line of enquiry and view non verbal gestures, which questionnaires do not allow. Powney and Watts (1987) make the distinction between respondent interviews and informant interviews. Respondent interviews are those where the interviewer is in control and the content is structured by the interviewer. The semi structured interview within this study takes this format as opposed to the informant interview where the session is much less structured and the interviewee's voice leads the discussion.

The link between this research on questioning and the guidance for conducting interviewing is very strong. Robson (1993) advocates that the interviewer should:

- Listen more than you speak

- Put questions in a straightforward, clear and non threatening way
- Eliminate cues which lead interviewees to respond in a particular way
- Enjoy it (or at least look as though you do)

This link is further highlighted by the use of terminology used to conduct the interview. The content of the interview, which can be prepared in advance, consists according to Robson (1993, p. 233) "of a set of items (*usually questions*), often with alternative subsequent items depending on the responses obtained; suggestions for so called *probes* and *prompts*; and a *proposed sequence for the questions* which, in a semi-structured interview, may be subject to change during the course of the interview."

There are similarities between interviewing and questionnaires and one may question why use both methods. With a questionnaire it is difficult to ascertain whether the respondent is giving serious attention to the questions whereas with an interview there is the added factor of observing non verbal gestures.

Getting started

As a starting point for this research, preliminary data has been collected in the form of a questionnaire and feedback from my peer observer. This was completed in academic year 2004/05. From this and my reading of the wider literature my questionnaire has been refined and a more structured format to the peer observation form designed. The new intake of P.G.C.E. E.Y. students started at the end of September 2005. At the start of their studies students were informed about my

research verbally and were offered the opportunity to be involved formally through a letter explaining the aim of the research and their involvement if that is what they agreed. The issue of confidentiality was also explained. There are fifteen students in the group and fourteen agreed to take part in the study.

In order to build up an accurate picture of the use of questions as an interactive strategy to enhance learning and teaching other data collecting tools were used. Observation, with a view to analysing my use of questioning in the classroom during a typical teaching session on the P.D.E. course, was completed. This took the form of a one hour recording of my teaching and this was completed on 31st October 2005 and analysed in November 2005 (appendix iii).

Immediately following this teaching session a semi structured interview was conducted with seven members of the cohort. (appendix iv) Although the original intention was to interview all the students, circumstances outside my control and external to the research prevented this. The use of a semi structured interview is an important part of the data as student attitudes to questioning is an area which has not featured greatly in past research. By the time the semi structured interviews were conducted students had been on the programme for 6 weeks and sound relationships which emphasise mutual trust and respect were established between the students and myself. The data collected from observations and questionnaires triangulated with field notes from interviews. Cohen and Manion (1994, p.254) define triangulation as "the use of two or more methods of data collection in the study of some aspect of human behaviour"

As has been previously stated, this research has grown from my personal concern to the use of questions as a more effective and interactive teaching tool both in order to meet the demands of the P.G.C.E. E.Y. programme, ie enable the students to meet the requirements of "Qualifying to Teach (TTA 2002), and to encourage students to become more active and reflective learners. A conscientious and reflective student and teacher need more than a body of knowledge to impart, they need to use teaching strategies which focus on thinking. From the literature it has been shown that questioning is a common and frequent teaching skill, however it is only a valuable teaching strategy when thoughtfully employed. Through the research methods identified I hope to develop my teaching skills to become an effective, strategic questioner which will ultimately encourage the students to become more critical thinkers. As Desforges et al (1986, p. 72). advocate,

> *Research requires no great intelligence. It does however demand a questioning attitude and a desire to understand. Research does not simply seek different ways to manipulate people and situations.*

Validity

From the outset, I believe that of utmost importance to my research will be the notion of validity. Miles & Huberman (1994) argue an approach to validity being where research participants are given the opportunity to check whether their views have been recorded accurately and also that they have the opportunity to verify the analysis and conclusions drawn by the researcher. Students have been assured of this from the outset of the data collecting exercise. As the subject of this research I have a responsibility for assuring the rigor of my work, however it should be acknowledged that as the subject I cannot be entirely objective. The P.G.C.E. E.Y.

students are my sample therefore the data collected from them may be viewed as being unreliable due to our relationship The students will be aware that I will be assessing them in their professional placement and on their academic work so the truthfulness of their responses, both on the questionnaire and in the semi structured interviews, may be suspect. However I intend to research the notion of using questions from different sources. This will give greater depth to my analysis. Thus I agree with Burton and Bartlett (2005, p. 28) that "in order to produce a more thorough and rigorous piece of research, several research methods are often used in conjunction with each other"

Validity will be strengthened through a climate of openness and a willingness to offer my findings for examination. Although conscious of the small scale nature of the research and the limited time scale in which it will be conducted I believe that this exploration of questioning could be empowering for all participants.

Ethics

My guiding principle is one that is succinctly expressed by Kane (1991, p.212) who emphasises "As a researcher your first responsibility is to the individuals you study, and your research must not interfere with their physical, social or mental welfare". As I am part of the research in that my practice, and the research act itself is aimed at developing and improving that practice, this research may be seen as being carried out for "professional advancement". According to Cohen, Manion and Morrison (2000) there is nothing wrong with this motivation providing that ethical issues are considered. In R.G. Burgess' book, "The Ethics of Educational Research" (1989) Kelly suggests that it is the area of action research where researchers must show

awareness of ethical issues such as confidentiality and respect for the people who are central to the research. As such the students in the study have a right to remain anonymous yet because there is only one P.G.C.E. E.Y. programme this could be seen as a dilemma. Likewise as I am the only tutor on the PDE course then I too could be easily identified. Diener and Crandall (1978) consider the right to privacy from three aspects; being sensitive to the type of information collected and disseminated and being sensitive regarding the setting for the research. This can be overcome by explaining to the students the aims of the research and that the consequences of the research will be open to all those involved. However there is no professional responsibility to share the raw data from the research and this should be destroyed when they are no longer needed. Feedback from the research is essential and for the purpose of my research this will include feedback to me from observers ie students and from me to the students. It is essential that this feedback is honest and that any personal discomfort is necessary in determining the truth. Deception will not take forward the study, truthful feedback should make the researcher feel "enriched by the experience and leave with the feeling that they (I) have learned something" Cohen, Manion and Morrison (2000). As I proceed with the research I take heed of Rudd's1985) views, when he claims that it is sometimes difficult to accept that no study is perfect, that not all variables can be controlled, that no instrument is totally free from bias and that no interpretation of results can be completely exhaustive.

Framework for the analysis

In order to build up the broad picture of my use of questions data was collected in a specific sequence.

1. Questionnaire
2. Taped session of 1 hour's teaching of PDE
3. Semi structured interviews.

The significance of this order and the sample size is discussed in the following chapter.

Chapter 4

Data collection and interpretation of results

Data has been collected using the selected tools as outlined in the previous chapter. The virtues of using a multi method approach have been emphasised. Other considerations for using the said methods have been taken into account such as the feasibility of the exercise in terms of time and my own skills and expertise as well as the potential ethical problems.

The outcome of the research is to improve my use of questioning in order to promote an interactive approach to my teaching on the P.D.E. course which is part of the P.G.C.E. E.Y. programme. To re-emphasise my starting point, P.D.E. is a course which focuses on the generic features of teaching and learning and the aim of this research is to explore how questioning can be a means to promote interactive teaching .

I began this data collecting exercise by explaining orally, to the students, why I was researching this area of my teaching. Terms such as "active enquiry", "problem solving" and "interaction" were defined at this point so that there was a shared understanding of these terms when they were used in the questionnaire and the subsequent discussions.

A letter of consent (appendix i) was then distributed at the start of the research and students had the option to take part. Out of a group of 15 students, 14 students agreed to participate and signed the consent form (appendix i).

The three research data collecting tools used were:

- Questionnaire (appendix ii)
- Transcript of 1 hour within a teaching session (appendix iii)
- Semi structured interviews (appendix iv)

The data was collected in the order as stated above; this was organised so students could complete the questionnaire without being influenced by the questions used in the interview or by my body language or non verbal gestures during the said interviews. As I am central to the research act itself, it is essential that I try to maintain objectivity whilst also being mindful that by trying to complete a good piece of research I do not become too detached from the subject.

All the statistical evidence for analysis stem from the results of these three data collecting tools. As well as the statistical data I will draw on the qualitative comments made by students in the interviews as these give a valuable insight into what individuals feel about a questioning approach to teaching.

1. Questionnaire

Questionnaire given to students on 28th October 2005

Question 1

Do I use questions to begin active enquiry?

Responses

- 8 always
- 4 often
- 2 usually
- 0 seldom
- 0 never

Question 2

Do I use questions to start discussions?

Responses

- 6 always
- 7 often
- 1 usually
- 0 seldom
- 0 never

Question 3

Do I use questions to involve all students?

Responses

- 2 always
- 11 often
- 1 usually
- 0 seldom
- 0 never

Question 4

Do I use questions to extend knowledge?

Responses

- 1 always
- 10 often
- 3 usually
- 0 seldom
- 0 never

Question 5

Do I use questions to encourage discussion?

Responses

- 5 always
- 9 usually
- 0 often
- 0 seldom
- 0 never

Question 6

Do I use questions for problem solving?

Responses

- 1 always
- 6 often
- 7 usually
- 0 seldom
- 0 never

Question 7

Do I use questions to encourage interaction?

Responses

- 4 always
- 8 often
- 1 usually
- 1 seldom
- 0 never

Question 8

Do I tolerate silences?

Responses

- 0 always
- 1 often
- 4 usually
- 8 seldom
- 0 never

1 nil return

Question 9

Do I allow sufficient waiting time?

Responses

- 2 always
- 11 often
- 1 usually
- 0 seldom
- 0 never

Question 10

Do I use question to show connections?

Responses

- 2 always
- 11 often
- 1 usually
- 0 seldom
- 0 never

Below is a matrix to illustrate the respondents spread of replies to the questions:

Number of question	Number of responses **Always**	Number of responses **Often**	Number of responses **Usually**	Number of responses **Seldom**	Number of responses **Never**
1	8	4	2	0	0
2	6	7	1	0	0
3	2	11	1	0	0
4	1	10	3	0	0
5	5	9	0	0	0
6	1	6	7	0	0
7	4	8	1	1	0
8*	1	4	8	0	0
9	3	8	3	0	0
10	2	11	1	0	0

*indicates a nil return

For ease of interpretation of results and the subsequent discussion I have clustered the questions from the questionnaire into groups. These groups were selected as there was a natural link between the focus of the questions

Interpretation

Questions 8 and 9

Do I tolerate silences?

Do I allow sufficient waiting time?

These were included to link with the view from the literature (Wragg 1993, Rowe 1978) that by extending waiting time, more students offered responses and that more detailed answers were given. Although 8 out of 14 agreed that I gave sufficient waiting time, 8 out of the 14 stated that I seldom tolerated silences. This could be a flaw in the design of the question as trainees could be interpreting silence as a mode of teaching and learning ie working in silence, whereas the question was designed to

find out whether I tolerated silences as part of thinking time before asking for an answer. One trainee omitted to respond to this question which could further indicate that there is a flaw in the design of the question.

Questions 3 and 7

Do I use questions to involve all students?

Do I use questions to encourage interaction?

These questions were designed to consider how my use of questioning encouraged interaction between the students which is different from interaction between students and tutor. One student responded that this seldom happened which appears to go against the trend of the group .The majority of the students responded positively to the two questions. Question 3 will be followed up more critically when the data which focuses on targeting questions to individuals or groups is considered.

Questions 4 and 6

Do I use questions to extend knowledge?

Do I use questions for problem solving?

Only 1 student stated that I always used questions to extend knowledge and for problem solving, which was interesting as I believed that this was something I did on a regular basis. The responses, however, do fit with the literature (Wilen 1991) on the use of questions to promote higher order thinking.

Questions 1, 2 and 5

Do I use questions to begin active enquiry?

Do I use questions to start discussions?

Do I use questions to encourage discussions?

These questions were linked to the notion of interaction through discussion. The returns show that students thought questions were very much part of my introductions to sessions and a device to involve them in the discussion. Active enquiry, interaction and involvement are key terms within the literature (Steinert & Snell 1999; Anning 1994; Moyles 1989) and students' responses show that this is a strong feature of my teaching.

Question 10

Do I use questions to show connections?

This question was included so students would consider the use of questions as a device to link prior knowledge and learning and so be used as a scaffold to take them on to new learning or experiences. The returns for this question again were very positive and further evidence from the lesson transcript should enable me to expand on this further.

Limitations of the questionnaire

Whilst the return rate was high I need to still bear in mind the limitations of this questionnaire. However feelings and attitudes relating to questioning could not be explored in this design. One question had a nil return and the same question had a

response that went against the trend of the responses, this could be a flaw in the design of that particular question. Although a five choice scale was used, respondents did not always choose the middle option as the literature indicates often happens (Robson 1993; Converse & Presses 1986). As the return rate was high the use of a follow up letter ((Kane 1987) was not necessary.

2 Transcript of questions asked in one hour's teaching

The following is a transcript of the questions asked in one hour at the beginning of the P.D.E. session on Monday 31st October 2005. The purpose of this data collecting exercise was to determine the number and type of questions asked therefore I have only transcribed the questions and not the answers. Where a question has been asked to follow up an answer I have indicted this by summarising the answer in italics. Questions asked to individuals as part of group discussion time have not been transcribed as the focus of the study is my use of questioning as a tool to support interactive teaching in a *whole class* situation.

Context for the observation

Students were sitting in self chosen groups of 3 or 4. There were 15 students present. Learning objectives for the session were that by the end of the session students will:

- Draw on the readings of behaviour management and organisation strategies and justify what they consider to be effective practice
- Formulate specific and testable learning objectives for lessons/activities

The session began with the register and then the tape began recording as I discussed some general programme matters. In this instance I was finding out who had taken

their skills tests for Qualified Teacher Status (QTS) and when meetings with Personal and Academic Tutors (PATs) were being held.

The full transcript of the one hour session is in appendix iii

Analysis of the one hour's teaching

To analyse the data in relation to the research questions ie the type and purpose of questioning on a P.D.E. course on the P.G.C.E E.Y. programme I have created a matrix using the headings **Type, Level, Target and Style,** all of which are aspects of questioning that my literature review highlighted.

- The **Type** of questions being classified as either open or closed
- The **Level** of questions being classified as either low or higher order
- The **Target** refers to questions which are either **directed** to individuals or groups or **undirected** and therefore open to anyone in the class to answer
- The **Style** refers to **new** questions or **follow on** questions which occur as a result of an answer.

Further definitions of the categories used on the matrix

Type: Open and closed

Open questions are those which require respondents to justify or illustrate their answers

Closed questions are those which yield a short answer

Level: low or higher order

These categories have been drawn from Blooms Taxonomy of thinking framework (1956)

These have been coded 0-6

0-2 being lower order

- 0 = management questions
- 1 = recall questions
- 2 = simple comprehension questions

3-6 being higher order

- 3 = application questions
- 4 = analysis questions
- 5= questions that require a degree of synthesis
- 6 = evaluative questions

Target: directed and undirected

Directed are those questions where I have used students' names or directed the question to a specific table of students.

Undirected are questions which are asked to the class of students and rely on anyone answering

Style: new and follow on

New questions are those not part of a sequence which are used to introduce a shift in the discussion

Follow on questions are those which use students' answers to clarify, probe or challenge the original answer.

Question number		Type		Level		Target		Style	
		open	closed	0-2	3-6	directed	undirected	new	follow on
	1		✓	0			✓	✓	
	2		✓	0			✓		✓
	3		✓	0		✓			✓
	4	✓		0			✓		✓
	5		✓	0		✓			✓
	6	✓		0		✓			✓
**	7	✓		0			✓		✓
	8		✓	0			✓	✓	
	9	✓		1			✓		✓
	10		✓	1			✓		✓
	11		✓	2			✓		✓
**	12	✓			3		✓		✓
*	13		✓	2			✓		✓
	14	✓		2			✓		✓
	15	✓			3		✓		✓
**	16	✓			3		✓	✓	
	17		✓	1			✓		✓
	18		✓		4		✓		✓
	19	✓			3	✓		✓	
	20		✓		3	✓			✓
	21	✓		1			✓		✓
	22		✓		4		✓	✓	
	23	✓			4		✓		✓
	24	✓		1			✓		✓
	25	✓		1			✓		✓
	26		✓	2			✓		✓
**	27		✓	1			✓	✓	
	28	✓		1			✓		✓
	29		✓	0			✓	✓	
**	30	✓			5		✓		✓
	31	✓			4		✓		✓
	32	✓			3		✓		✓
	33		✓	2		✓			✓
	34		✓	1			✓		✓
	35		✓		3		✓		✓
	36	✓			3	✓			✓
**	37		✓		3		✓		✓
	38	✓			5	✓			✓
	39		✓	2		✓			✓

Question number		Type		Level		Target		Style	
		open	closed	0-2	3-6	directed	undirected	new	follow on
	40	✓			3		✓	✓	
	41	✓			5		✓	✓	
	42	✓			4		✓		✓
	43	✓			3	✓			✓
**	44	✓			5	✓		✓	
	45		✓		3		✓	✓	
	46	✓			5		✓		✓
	47		✓	1			✓	✓	
	48		✓	1			✓		✓
	49	✓			5		✓		✓
**	50	✓		1			✓		✓
	51	✓			3		✓	✓	
	52	✓			3		✓		✓
	53		✓	2			✓		✓
*	54	✓			3		✓		✓
**	55	✓			3		✓		✓
	56		✓	0			✓	✓	
**	57	✓			5		✓		✓
*	58		✓		3		✓		✓
**	59	✓		2			✓		✓
	60		✓	2			✓		✓
	61		✓	1			✓	✓	
	62	✓			3		✓		✓
**	63	✓			3		✓		✓
	64		✓	0			✓		✓
**	65		✓	1			✓		✓
	66		✓	2		✓			✓
	67	✓		2			✓		✓
	68	✓		2			✓		✓
	69	✓			3		✓	✓	
	70	✓			5		✓		✓
	71		✓		3		✓	✓	
	72	✓			5		✓		✓
	73	✓			3		✓	✓	
	74	✓			3		✓		✓
	75	✓			3	✓		✓	
	76		✓	2			✓	✓	
**	77	✓			3		✓		✓
	78		✓	2			✓		✓

* indicates questions asked and answered by the tutor.

** indicates wait time of 3 or more seconds between question asked and a response given.

Summary of information

In total 78 questions were asked in one hour. This information can be summarised as follows:

Type

Open questions 44/78

Closed questions 34/78

56% of questions asked were open and 44% were closed

Level

Lower order questions 39/78

50% of questions asked were lower order questions.

14% were Management questions 11/78

18% were Recall questions 14/78

18% were Comprehension questions 14/78

Higher order questions 39/78

50% of questions asked were higher order questions

32% were Application questions 25/78

6% were Analysis questions 5/78

12% were questions which required Synthesis 9/78

0% Evaluative questions were asked 0/78

Target

Directed to groups or individuals 13/78

17% of questions were targeted at individuals or a specific group of students

Undirected 65/78

83% of questions were undirected ie open to any student to answer

Style

New questions 22/78

28% of questions of questions started off a topic of discussion or were a shift from previous question

Follow on questions 56/78

72% of questions were follow-on ie questions which clarifies, probed or challenged previous answers.

Overall response to the analysis of the transcript

Some interesting features are beginning to emerge which relate to the literature such as the number of questions asked and the ratio of the percentage of lower to higher order questions asked. Teachers ask up to two questions every minute (Hastings 2003) and in this transcript I asked 78 questions in an hour, so on average fewer questions than the generalised findings. Already the data of questions used to recall facts and previous knowledge and their use to deepen understanding and encourage problem solving is not in line with the literature. An equal number of low and higher order questions were asked in the teaching session whereas the literature (Wragg 1993) put the percentage of higher order questions asked in an hour as much lower, 8%. There was a high percentage of questions asked which were part of a sequence of 4 questions whereas the literature (Wragg 1993) found that only 10% of questions were part of a sequence of 4 or more questions. Only three questions were asked and

answered by the tutor in the one hour session and further analysis, outside the scope of this study, will be required to interpret the reasons for this. The following questions:

- Do my questions motivate the students?
- Do I model for students the sort of questioning strategies that they may want to take into school and use as part of their teaching?
- Do the ways I ask questions foster an atmosphere of trust where students' opinions and responses are valued?

could not be analysed from this transcript, but answers to these questions may emerge from the analysis of the semi structured discussion with the students or from the questionnaire and will be considered as part of the discussion in Chapter 5.

Limitations of the recording

The analysis focused on the questions asked as part of the *whole class* teaching session so questions asked to individuals in the discussion time were not recorded therefore there may have been a different set of findings if these questions had been included. Wragg (1993) found that only 1% of questions asked in small group sessions were categorised as being higher order. Because I had not recorded the questions asked during small group discussion the findings of Wragg (1993) could not be challenged or verified. Wait time of 3 or more seconds was recorded and noted by ** in the matrix. The results show that out of 78 questions asked only14 had wait times for answers of 3 or more seconds. When reviewing the taped session I became aware of the number of times I repeated students' answers as part of my response to their answers. If the analysis had taken account of the timings between

questions I could the have analysed my use of silence. This is something that was alluded to in the responses from the questionnaire and needs further exploration and could be the focus for future studies.

3 Semi structured interviews with students on the PGCE EY programme 2005-06

These semi structured interviews took place on Monday 31st October 2005 following the taught session which was recorded and transcribed. Seven students out of the fourteen students who had agreed to take part in the research were interviewed. The original intention was to interview all the students. However, I had to review this decision based on time and manageability due to some organisational changes in the teaching timetable. The sample size was arrived at based on the students who had the shortest journey from university to home. A semi structured approach to the interviews was used. I structured the interview by using a series of questions so that I, as the interviewer, had control of the content. These questions were designed to focus on students' attitudes to a questioning approach, their awareness of the use of questions as a teaching strategy to promote interactive teaching and to find out how they would or would not transfer questioning strategies to their practice in the classroom with children. Field notes of the interviews are included (appendix iv).

Questions used to guide the discussions and students' responses.

Question 1

What do you think the purpose of questioning in Professional Development Education (PDE) is for?

Responses

Involvement and participation

3 students used the term "involvement" and said questioning was used to include all students.

1 student said they were used to prevent a silent classroom.

Recall

5 students talked about questioning as a way to check understanding and review what they already knew. 1 also said that questioning was to make links between what they knew and didn't know.

Application

1 student said they were used to legitimise their actions in schools.

2 said they were for gathering opinions and views and 1 said they were for modelling new and technical vocabulary.

Challenge

2 students said they were used to challenge existing views and 1 said they were used to encourage students to ask questions.

Use of time

1 student said they were used to give the tutor's voice a rest.

Summary of question 1

4 students said it was a teaching tool to involve students and encourage participation

6 students viewed the use of questions as a strategy to recall information from a previous session and to make links with previous experiences and knowledge.

3 said they were use to model language and application of practice

3 said they supported an interactive dialogue

1 said they were used as a management strategy

Question 2

In which ways did questions help you learn today?

Responses

Thinking

4 students said that questioning helped to clarify their thinking.

2 students said that they helped o articulate their thinking.

1 said they made them think more critically.

Application

3 said that they helped to put learning and vocabulary into a meaningful context

2 students said that they learnt about giving "wait time" and how to use answers

Challenge

1 said that students' answers challenged their thinking

2 said that questions made them consider different viewpoints

Summary of question 2

6 students said that questioning developed their thinking

5 students related the use of the questions to a context

3 students said that the questions made them evaluate their own and each others' views

Question 3

How can the use of questions affect the classroom climate?

Responses

Interaction

4 students said that questions can prompt discussion and create a lively environment.

Type and number of questions asked

4 students said that the climate is affected by the number and type of question asked.

Management

1 said that when questions are asked as a behaviour management strategy then the effect is negative.

1 said it depended on the size of the group, as this is a small cohort then all students involved.

1 said that this changes as the members of the group become more secure with each other.

Summary of question 3

4 said that questioning contributes positively to the classroom climate

4 associated the effects of questioning on the classroom climate to the type and number of questions asked.

Some students said that the size of the group, the relationships within the group and whether questioning was being used as a behaviour management strategy, had an effect on the classroom climate.

Question 4

How do you feel when questions are directed at you?

Responses

7 students said that they felt fine with this

1 said that the use of her name was important

1 said this was okay for recall questions as she had a good memory

1 said that this was fine as long as her answers were considered

1 preferred having a question directed at her following discussion time

2 said that this was okay now, as all students had got to know each other

Summary of question 4

All students were positive about having questions directed at them.

Question 5

In what ways do you respond to a questioning approach?

Responses

7 students said that they liked a questioning approach, reasons given were that they liked having their opinions listened to and valued

2 said they liked a balance of teaching styles as too many questions can be like a "machine gun" and reading and explanation were important to base questions on.

Summary of question 5

All students responded positively to a questioning approach

Question 6

In a course such as PDE what is your preferred style of teaching and learning?

Responses

6 students said they preferred discussion

3 of the 6 also mentioned the use of videos

1of the 6 said she liked recording information in different ways

2 out of the 6 said they liked questions used to summarise learning

1out of the 6 said she liked tie for questioning from students

1 said she preferred being given information and then having follow up questions

Summary of question 6

All students preferred an interactive approach to learning and teaching. Interactive approaches included the use of illustrative evidence, questioning and explanations

Question 7

What questioning strategies will you take into the classroom?

Responses

5 out of the 7 students mentioned the importance of answers, their comments included: listening to answers, valuing answers, extending answers

2 out of the 7 mentioned the positive effect of using children's names when directing questions

1 student mentioned the importance of the number and speed of questions asked and the importance of giving sufficient time to answer.

3 out of the 7 students talked about not using threatening body language when asking questions.

1 of the 7 students talked about using questions to summarise learning

Summary of question 7

All students had a range of questioning strategies to take into the classroom, these included using answers to extend learning, giving children time t answer and being aware of their body language and non verbal gestures when asking and answering questions.

Overall response to the semi structured interviews.

The design of the questions to guide the discussion has allowed me to collect information in addition to the transcript of the teaching session. As the interviews were conducted on the same day as the transcribed lesson there were opportunities for the students to use the context of the session for exemplification, however, no students drew explicitly on the specific detail of the session in their interview.

Limitations of the semi-structured interviews

Due to organisational issues I was unable to interview all the students. If repeating this exercise I would ask permission to video the interviews this would allow greater detail to support the discussion. By videoing the interviews students' body language and my use of non verbal gestures could be analysed with the data collected and therefore the analysis would be richer. However, the results from the interview have given me information about attitudes and feelings which could not be collected from the questionnaire.

Summary of the data collected.

The data collected has given me some useful material to start answering the questions set out at the start of this research. The questions asked on the questionnaire and used in the semi-structured interview relate to the literature reviewed which will enable me to make comparisons and draw conclusions. The inclusion of the transcript of the teaching session acknowledges the importance of modelling the approach to asking questions. Limitations of each data collecting tool have been recognised and referred to following the interpretation of each set of data. A longer time frame to collect the data would have allowed me the opportunity to revisit and refine the data collecting methods. However this research is a starting point for evaluating my use of questions to promote an interactive approach to my teaching and from the following discussion aspects of my questioning may be identified for further research.

Chapter 5

Discussion

This chapter develops on the results presented in the previous chapter which details the questioning approach used on a P.D.E. course on the P.G.C.E. E.Y. programme. Four key questions form much of the focus for this discussion. Throughout, attention is paid to what the students say alongside what I do. This discussion also makes reference to the literature review in Chapter 2 and the findings from the data collection outlined in Chapter 4.

The four main questions which provide the framework for this discussion are:

1. Why ask questions?
2. What types of questions are asked?
3. How are questions asked?
4. What are the effects of a questioning approach on students' attitudes to learning?

Why ask questions?

The starting point for this study was a review of my teaching strategies on an intense one year P.G.C.E. programme. Student evaluations had identified that too much content was included in each session. From comments made on my tutor perception evaluations I believed that I used more "explanations" than "questioning" as a teaching strategy. A desire to employ a more interactive style of teaching where students and tutor were actively involved in the learning process was the overall aim of my research. My belief is that more interaction and purposeful activity will

promote reflective and deep learning and ultimately transform learning from a passive activity to one which requires critical thinking. Steinert & Snell (1999) described interaction as a means of promoting active learning ie being involved with the material and content of the session. The review of the associated literature suggests that interactive teaching involves an increased interchange between tutor, students and lecture content (Steinert & Snell 1999). Interactive lectures can promote active learning, heighten attention and motivation, give feedback to tutor and students and increase satisfaction for both (Steinert & Snell 1999). Findings from the literature review identify questioning as a strategy to support interactive teaching. Hastings (2003, p.2) argues that

> *Questions serve many purposes. They can help students to reflect on information and commit it to memory. They can develop thinking skills, encourage discussion and stimulate new ideas....They are an important tool for managing the classroom, helping to draw individuals into the lesson and keeping them interested and alert. And questions have a symbolic value- sending a clear message that students are expected to be* ***active*** *participants in the learning process.*

The data from the questionnaire and from the semi structured interviews confirmed this, as students commented on the use of questions being a strategy to involve them all and increase participation. Comments such as "questions involve everyone so the session isn't all tutor talk" and "questions keep us all involved" were made by the students. Students also confirmed that questions were used by the tutor as a means to confirm what they knew about the subject and to challenge their views. Overall students believed that being asked questions helped them to extend their existing knowledge. In fact 1 student made reference to "a devil's advocate" approach to

questioning which made her think more critically as well as supporting an interactive dialogue. Educational research (Butler 1992; Feden 1994, Kraft 1985; Murray 1991) has shown that students who are actively involved in their learning learn more than students who are passive recipients of knowledge. In this respect 4 students stated that questions helped them clarify their own thinking. 2 students believed that questions helped them to articulate what they were thinking about their practice and 1 student said that questioning made her think more critically .

Data collected also indicated that my use of students' answers also challenged their thinking and made them consider different viewpoints. Four students stated that a questioning style of teaching created a lively environment. Motivation, an identified feature of interactive lectures, can then be said to be achieved through a questioning approach. In fact Steinert and Snell (1999) report that students who attend lectures where many questions are asked believe that the lecture is more stimulating. This concurs with Butler (1992) who found that student satisfaction increased when the students were actively involved in a "lively discussion." The findings from the reviewed literature are that arousal and motivation are essential ingredients for learning and that attention spans diminish significantly after 20 minutes of elicitation (Fredrick 1986, Foley & Smilansky 1980). There is evidence from the collected data that students are more engaged with the learning and teaching process within this lively atmosphere. Half the students in the case study said they liked a questioning approach and commented positively on its purpose as part of the learning process. From the semi structured interviews students discussed the importance of balancing questioning with the giving of information. Having some

"factual information" to discuss was identified as an important precursor to questioning. Such factual information can be delivered by videos, the sharing of tutor knowledge and experience and using readings. That said a surprising response from the semi structured interviews, as to the purpose of questioning, came from 2 students who thought questioning was a behaviour management tool to keep all students alert; 1 student who thought questioning was used to give the tutor's voice "a rest" and another stated that questioning was a device used to prevent a "silent" classroom.

An overall belief on behalf of the students was that questions are used to check their knowledge and to review what they already knew and understood. Data interpretation from the transcript of my teaching found that this notion of questions being used to recall knowledge is lower (18%) than the research findings of Wragg (1993) who when researching teachers' use of questioning found that 35% of questions required students to recall what they knew. However his research also found that the greater percentage of questioning was related to class management (57%). This was not represented in the analysis of my data where only 14% of the questions were associated with management issues. This could be because his research was based on primary age children whilst the subjects for my study were post graduate students who tend to be more autonomous and practised learners.

From the data analysed, in respect of 'why ask questions' certain conclusions can be drawn:

- Students were very positive about the use of questions in the teaching session.

- They believed they were used as a device to encourage participation.
- There was a correlation between what they considered to be the purpose of questions and their thinking.
- They preferred a balance of teaching strategies, that of discussion and questioning, where questions were used alongside the giving of information, the use of illustrative evidence through personal examples and video and textual information.

Types of questions

The literature review identified that there are different types of questions asked and they serve different purposes. How questions are categorised depend on the author and the literature considered a number of examples (Wragg and Brown 1993; Gilbert 1997; Kerry 1989). The findings from the analysis of the transcript found that 56% of the questions asked were open, 44% were closed. Open questions permitted a range of responses, whereas the closed questions implied that I had a predetermined 'correct' response in mind. Closed questions were used at the beginning of the session and related to management questions, for example, "who has passed the skills test" and "when is he coming over?" Recall questions where pre existent knowledge by the student was the required answer were also asked near the beginning of the session, for example "What was the overall theme of last week's session?" This reflects the findings of Wilen (1987) who stated that the function of questions differed depending on when in the session they were asked and that at the beginning of sessions the questions usually took the form of "what do you already

know or remember?" The data collected from the questionnaire identified also that students also believed that questions asking them to recall facts were used mainly at the beginning of sessions, 6 out of the 14 students stating that questions were always used to start discussions. The analysis of the levels of questions asked in the one hour transcript challenged the findings from research reviewed in the literature. Gall's research (1970) showed that only 20% of questions from his research required higher order thinking, whereas Wragg's (1993) and Kerry's findings (1989) showed that 8% and 4% respectively, required higher order thinking. Interpretation of the type of questions asked in my one hour of teaching showed that there was an equal balance between the questions which required low order thinking to those which required higher order thinking. However, an interesting result of the analysis of the transcript, using the scale 0-6, found that questions requiring evaluative thinking (6) were not used at all. There was no use of questions such as "which approach to behaviour management is likely to have the greatest impact?" Rather, application questions, which also sit in the higher order category, were most dominant. The findings showed that 32% of questions asked were in the higher order spectrum and in particular in that field where students were required to apply their knowledge in order to answer the questions. Questions such as "Where do you think, in a lesson, it is most likely to occur" and "Why do you think in this instance the comments don't match up?" allowed the students to recall prior knowledge and apply and analyse the best approach to discuss. This sits unsurprisingly within the context of the session where students are required, in Qualifying to Teach (TTA 2002), to

demonstrate their knowledge and understanding. By setting questions and answers within a context allowed me to assess their knowledge and understanding.

The results from the questionnaire found that 10 students (71% of the cohort), stated that questions were often used to extend knowledge which is not reflected in the number of analysis or synthesis questions asked in the teaching session that was transcribed. The data showed that only 18% of the questions required students to analyse and synthesise their knowledge and understanding. As a result of these findings there are therefore, implications for my future use of questions as a teaching strategy to deepen students' thinking levels and improve conceptualisation.

From the data analysed, in respect of 'what type of questions are being asked' certain conclusions can be drawn:

- Open questions were used more than closed questions
- The primary functions of the closed questions were to deal with management issues and to recall facts from prior learning.
- Although there was a balance between low and higher order questions, questions requiring students to be evaluative were not included in the teaching session recorded.
- Students generally believed that I used questions to encourage problem solving.

How to ask questions?

Stevens' observations (1912) of teacher questioning found that teachers asked 395 questions a day and Pate and Brener's research (1967) calculated that most teachers

ask an average of 43.6 questions per teaching hour. The analysis of the transcript of my teaching showed that 78 questions were asked in 1 hour which is a higher percentage of questions asked than the findings from previous research.
The literature review identified that for questions to be effective they have to be well targeted and everyone in the learning group has to be involved (Kerry 2002). Thirteen students believed that my questions often or always involved all the students. The transcript however showed that the majority of the questions were undirected, that is they were open to all students in the group to answer. Only 13 out of the 78 questions were targeted to individuals or a specific group of students. The problem with asking undirected questions is that students can sit back and rely on the more vocal members of the group to answer By using this open approach to questioning I firmly believed that I was giving everyone an opportunity to respond, but in reality, it was only a minority of the students who offered answers when this style of undirected questioning was used. The transcript data showed that I directed questions to individuals and to specific groups who I knew would give me the answers I wanted. This highlighted that I was unconsciously biased towards certain individuals and groups. It could also have illustrated that there are dominant members of the group or that students sitting in a particular area of the classroom were being targeted. This is something which needs further research.

In the interview with the students half the group felt "fine" or "okay" when questions were directed at them. This was clarified further by them saying that relationships between each other and tutor were good and so they did not feel

threatened by targeted questions. From the interviews, 2 out of the 7 students interviewed believed that using children's names was a positive strategy and that they would use this approach in the classroom. One student believed that it was important that answers were considered and this corresponded to another student's view that a "machine gun approach" where questions were asked in quick succession was not acceptable. This again was something identified in the interviews as a student talked about the importance of the speed of questioning and the number of questions asked as this could potentially affect relationships and the ethos of the classroom.

The importance of planning questions was identified in the literature, (Broon & Atkins 1990). However too close attention to asking the planned questions can result in insufficient time and attention being given to answers. Furthermore, by planning questions the tutor can move through these questions too quickly so the emphasis is placed on the sequence of questions rather than responding to the answers. Hyman (1970) argued that planning questions should not be so rigid that teachers knew ahead of time exactly which questions to ask at a given time. From the response to a student's answer, the transcript indicates the surprise in my response as an answer is not expected and this interrupts the following question. In fact I respond with "Good point, I don't think I've had that answer before" and instead of pursuing the thinking behind the student's answer I moved on to ask another question to the whole class. Analysis of the transcript found that 28% of the questions stood alone ie they were not part of a sequence of questions. This is lower

than Wragg's findings (1993) who found that 50% of questions stood alone. The same research found that only 10% of the questions asked were in a sequence of more than 4 questions. This corresponds exactly to the analysis of the transcript .The follow on questions varied from clarification of answers to probing and challenging students answers.

The review of literature (Hastings 2004; Swift and Goodings 1983; and Rowe 1974) concluded that increasing wait time increases the quality of the responses from students. Transcription of my questions did not include an analysis of "wait time" given to students before an answer was required. However, views on 'wait time' have been drawn from the questionnaire. Thirteen students declared in their responses on the questionnaire that sufficient wait time is given. The question about silence within the teaching session resulted in 8 out of 13 (1 nil response) responding that I seldom tolerated silences. This could be at the heart of the reason for identifying questioning as an aspect of my teaching which I wanted to develop. Depending on how the data is interpreted this could indicate that silences are viewed, by me, as a waste of valuable teaching time and therefore questions are used or explanations given to fill the session with student or tutor talk. This view could be linked with the fact that some questions asked are answered by myself (3 out of 78.) The analysis does not allow me to determine whether this was because I did not give sufficient wait time for the students' to answer. Kerry (2002) believes that teachers are reluctant to leave a silence in their questioning as this can be filled with off task talk, he further states that this reluctance can also be attributed to an inexperienced

teacher. The commitment of the P.G.C.E. students to their work and my years of teaching experience do not lead me to believe that these are the answers. I return to the issue of teaching a specified content coverage within a limited time frame. As well as answering one's own question another mannerism identified in the literature (Kerry 2002) is that of repeating back a question. However repeating back a question did not appear to occur in the taped session. This strategy is often used to fill in the time between asking the question and obtaining a student response. Repetition is legitimate if it is to clarify a complicated question, but again this should not be used regularly as the gap between asking and answering a question has already been highlighted as being valuable "thinking time."

From the data analysed in respect of how to ask a question certain conclusions can be drawn:

- The majority of the students believed that my questions involved them all
- Transcription indicated that 1 out of 6 questions were directed at individuals or specific groups, indicating a possible bias towards asking the most able and failure to notice non participants.
- Listening to answers was more important to students than the number of questions or type of questions asked.
- Planning of questions should not be so rigid that due regard is not given to answers.
- Silence is not a feature of my classroom

The effects of questions on students' attitudes

The analysis so far has examined the skill of questioning along with related matters such as how questions can help students articulate their learning. The exclusive concern has been with oral questions. However the effect of questions on students' attitudes to learning and how it can affect the classroom climate needs now to be considered from the data collected. Whilst the data from the interviews provides the main evidence base it is possible to draw some conclusions regarding students' attitudes and classroom climate from the transcript of the teaching session and feedback from my peer observation. Students believed that tutors' reasons for asking questions influenced their views on questioning as a teaching strategy. When questioning is used as a management device such as to keep students on task, 1 student believed that it had a negative effect on the classroom climate. The type and number of questions asked were also contributing factors to students' attitudes and the classroom climate. For example more than half the students interviewed made reference to questions creating a "lively" environment which can be described as being positive. The relationships between the students and between the students and myself were also contributing factors to how they felt about questions. They made particular reference to those questions which were directed at individuals or specific groups of students. One student referred back to how she used to feel when teachers at school directed questions at her "I felt picked on." Another recalled how she felt at the beginning of the programme when questions were directed at her, "felt scary as unsure of others' reactions." How I responded to answers was found to be important too. Students used the term "valued" to indicate that this was done in a

positive way. From responses to the question about what questioning strategies would they take into the classroom, tutor's body language was mentioned and 3 out of the 7 students interviewed stated that they would not use threatening body language. This could be interpreted as something they had witnessed and so saw this as a negative feature of questioning. Conversely they have not have witnessed the negative use of body language and so drew on the positive model that I had presented.

From the transcript there were 6 occasions when before moving on to another question I responded with "good" so this could also be interpreted as a way to create a positive atmosphere within the classroom. However, Brophy (1981) reviewed the research on teacher praise and concluded that praise is effective but only if it is specific and credible. Frequent praise that is trivial and inappropriate can be viewed by students as patronising and therefore is ineffective.

The size of the group was thought to affect the students' attitudes to questions. The group size in the research was 15 students and they had been together for 2 months. The length of time together as a group was highlighted by 2 students as something which could affect their response to how they felt about being questioned. This was something that I considered at the outset of the research. By the time the data was collected students had established where they were in their learning and in their relationship to each other and I had assessed some initial knowledge about them as individuals and their experience to date. "Peer fear" had been identified in the literature as a possible reason for students being reluctant to answer questions, this

could have been one of the findings from the data if the research been carried out before relationships had been established and if my use of questioning was viewed as threatening in style. Evidence of my relationships with students can be obtained from the peer review feedback (appendix v) which commented on the "close relationships between you and each of your students", and "the students are friendly and the atmosphere is very relaxed." Martin (1997) found that students' attitudes towards their tutor became more negative as the tutor increased the use of higher order cognitive questions. However, there was no evidence of this from the transcript. The middle part of the transcript contained more higher order questions yet my personal perception from the answers did not indicate any negativity. This is perhaps, something which could be better observed by a third person and may form part of the focus for future research.

From the data analysed in respect to the effects of questions on students' attitudes, certain conclusions can be drawn:

- Student teacher and student student relationships are factors when using a questioning approach to teaching.
- Teachers' body language and non verbal gestures are important characteristics which can affect the classroom climate and students' attitudes to learning
- There is no evidence of students' attitude towards me deteriorating with the increase in the number of higher order questions asked.

Chapter 6

Conclusions and recommendations

This research study has provided me with some insights into how my use of questions can promote interactive teaching on a P.D.E. course on the P.G.C.E. E.Y. programme at the Warrington Campus, University of Chester. Theoretical ideas regarding the relationship between questioning and interactive learning and teaching and their effect on students' attitudes were reviewed in Chapter 2. The overall aims of the research were indicated in the introduction and explored through a series of questions. These were:

- Why ask questions?
- How questions differ in their nature and effectiveness?
- How can questions be used more effectively?

The major findings that emerged from the result of this case study can be summarised as follows:

Questions were used to involve students and encourage them to participate, however the research findings indicated that the focus for this interaction was between me and the students that is my questions and the students' answers. How students' commented on or explored each other's answers was not a feature of this research. There was, therefore, lost opportunities to explore how students responded to or expanded on peer feedback which could have shifted the emphasis from me as the teacher to them as learners. This supports the feedback comments from my peer observation (appendix v) "you may wish to consider the use of students commenting

on one another's responses rather than the onus being on you...getting tables to summarise and clarify is another way of shifting the emphasis from you as a teacher to them as learners" Students' overall belief is that questions are used to check understanding and recall knowledge. The findings from the analysis of my use of questions from the taped session also confirm this.

My questions and responses give immediate feedback to students on what they know and understand. However insufficient use of questioning by me is used to help students develop their thinking and move it from the concrete to the analytical and evaluative. Although the percentage of higher order questions asked was greater than in the literature reviewed it is important to note that the literature focused on school age children, not post graduate students who were the centre of this research. One could presume that my "audience" (postgraduate students) are used to being more critical thinkers and so I should have planned to use more higher order questions.

The questions that I asked were predominantly directed at the group as a whole with only 17% being asked to individuals or a specific group. This is despite students commenting that they did not feel threatened when questions were directed at them through the use of their names. The literature argues that how questions are asked has a correlation to how students feel about their tutor (Martin 1979). From the analysed data there was evidence that students believed that there was a positive relationship within the group with trust and mutual respect being a feature of the classroom climate. From this it can be concluded, for this particular group of

students, that the level of questions did not affect the relationship between myself and them.

The number of questions I asked in 1 hour fell short of the findings from literature. This again could be related to the make up of the students, that is they were post graduate students and the research was based on school age children. How the content of the session is organised for example, the amount of time given to discussion and reading is a factor in this. No findings indicated that the number of questions asked related to behaviour management strategies that is that questions were not used as a device to keep students on task.

Silence as part of my teaching strategy was not tolerated and on three occasions questions were answered by myself. This indicates a didactic teaching style whereas by being silent when a student respond to a question could have encouraged students to voluntarily step in and raise questions.

How I asked questions and responded to answers have, I believe, given the students a model of questioning which they will take into school. The importance of valuing answers and not giving sarcastic responses was highlighted as important features which they said would become part of their practice in school.

The overall findings emerging as a result of this case study allow for general recommendations which may go some way towards elucidating the use of questions on a P.D.E. course.

1. Prepare to ask fewer, better questions. This includes

- deciding on the level of questions asked,
- considering how they are to be distributed to the group
- developing strategies for extending students' responses
- encouraging students to ask each other and tutor questions
- giving time for students to respond to questions

More time, by me, needs to be spent on planning how to frame questions that are worth asking, ie questions which explore issues and concepts that are critical to the development of students' understanding. By increasing "wait time" it is likely that more students will become involved in question and answer discussions leading to an increase in the length of their responses. A consequence of this strategy could make me more aware of students' misconceptions. This then would mean that my follow on question would address these errors and so I would be focussing on the students' real learning needs. To exploit such a change in my questioning strategy it will be necessary to move away from the routine factual, recall questions and to refocus my attention on the quality and the different levels of questions. The questions themselves then become a more significant part of teaching, with attention focused on how they can be used to explore and develop students' learning. The learning environment requires a classroom culture where students are comfortable

with giving a "wrong" answer. The relationship between student and student and tutor and students needs to be such that they are happy for other students to help explore their views.

2. Use the findings from this case study as a starting point for future inservice training with colleagues. This includes:

- Discussing with colleagues and observing each other's lessons
- Using peer assessment to improve questioning

To incorporate some of these recommendations into the School of Education practice, the first step is for all tutors to reflect on how everyone uses questions at the moment. Discussion with colleagues and observation of each other's lessons can help with such reflection. A common framework to analyse the use of questions will assist lecturers with the observation and to share their findings (appendix vi). Mutual observation and the sharing of ideas and experiences can give help and support with specific questioning techniques. Such work could be incorporated into the Learning and Teaching Strategy so that evaluations of findings and dissemination of practices can provide a firm basis for the adoption of new practices on a wider scale.

Possible outcomes from these recommendations could be that students will become more active participants in the teaching and learning process. They will come to realise that learning may depend less on their capacity to demonstrate what they have remembered, to spot the right answer and more on their readiness to express

and discuss their own understanding. My role and that of colleagues will then shift from being a presenter of content to a leader of exploration and development of ideas in which all students are involved.

My personal challenge now is to study more intensely those questioning strategies that lead to higher-order thinking and to explore ways to use my questions to promote students' independent thinking.

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Appendices

Appendix i

Sample Letter to students

University of Chester
School of Education
28.10.05

Dear trainee,

I am researching the use of questioning as a tool to promote interactive teaching within the PDE course of the PGCE EY programme. This course has a lot of content that has to be covered in order for you to meet the Standards for QTS. The aim of the research is to consider how questions rather than exposition can be used as a teaching tool. As part of the research I will be asking you to complete a questionnaire (anonymously) and take part in a semi - structured interview. The findings will be submitted as part of the discussion in the research. I will share the findings with you. At no point in the research will you be identified other than being part of the PGCE EY programme 2005/06.

In order for me to meet the requirements of the ethics statement for the School of Education I require your signature which will then enable me to draw on the data from the questionnaire and interviews.

If you are willing to take part in this study please sign below.

Thank you

Joy Roberts

I (insert full name)..... .....
agree to take part in this research by completing a questionnaire and taking part in a semi-structured interview. At no time will my name be used as part of this research nor will I be identified in any other way other than by being part of the PGCE EY programme 2005/06.

Date..31/10/05.....

Please leave this form of consent in the box in B8

Appendix ii

Completed questionnaires

Questionnaire on questioning

Please circle only **one** of the following after each statement:
always, often, usually, seldom, never

Do I use questions to begin active enquiry?
always, often, usually, seldom, never

Do I use questions to start discussions?
always, often, usually, seldom, never

Do I use questions to involve all students?
always, often, usually, seldom, never

Do I use questions to extend knowledge?
always, often, usually, seldom, never

Do I use questions to encourage discussion?
always, often, usually, seldom, never

Do I use questions for problem solving?
always, often, usually, seldom, never

Do I use questions to encourage interaction?
always, often, usually, seldom, never

Do I tolerate silences?
always, often, usually, seldom, never

Do I allow sufficient waiting time for you to answer questions?
always, often, usually, seldom, never

Do I use questions to show connections between previous and new learning?
always, often, usually, seldom, never

Thank you

Please put completed questionnaire in the box in B8

Questionnaire on questioning

Please circle only **one** of the following after each statement:
always, often, usually, seldom, never

Do I use questions to begin active enquiry?
always, often, usually, seldom, never

Do I use questions to start discussions?
always, often, usually, seldom, never

Do I use questions to involve all students?
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Do I use questions to extend knowledge?
always, often, usually, seldom, never

Do I use questions to encourage discussion?
always, often, usually, seldom, never

Do I use questions for problem solving?
always, often, usually, seldom, never

Do I use questions to encourage interaction?
always, often, usually, seldom, never

Do I tolerate silences?
always, often, usually, seldom, never

Do I allow sufficient waiting time for you to answer questions?
always, often, usually, seldom, never

Do I use questions to show connections between previous and new learning?
always, often, usually, seldom, never

Thank you

Please put completed questionnaire in the box in B8

Questionnaire on questioning

Please circle only **one** of the following after each statement:
always, often, usually, seldom, never

Do I use questions to begin active enquiry?
always, often, usually, seldom, never

Do I use questions to start discussions?
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Do I use questions to involve all students?
always, often, usually, seldom, never

Do I use questions to extend knowledge?
always, often, usually, seldom, never

Do I use questions to encourage discussion?
always, often, usually, seldom, never

Do I use questions for problem solving?
always, often, usually, seldom, never

Do I use questions to encourage interaction?
always, often, usually, seldom, never

Do I tolerate silences?
always, often, usually, seldom, never

Do I allow sufficient waiting time for you to answer questions?
always, often, usually, seldom, never

Do I use questions to show connections between previous and new learning?
always, often, usually, seldom, never

Thank you

Please put completed questionnaire in the box in B8

Questionnaire on questioning

Please circle only **one** of the following after each statement:
always, often, usually, seldom, never

Do I use questions to begin active enquiry?
always, often, usually, seldom, never

Do I use questions to start discussions?
always, often, usually, seldom, never

Do I use questions to involve all students?
always, often, usually, seldom, never

Do I use questions to extend knowledge?
always, often, usually, seldom, never

Do I use questions to encourage discussion?
always, often, usually, seldom, never

Do I use questions for problem solving?
always, often, usually, seldom, never

Do I use questions to encourage interaction?
always, often, usually, seldom, never

Do I tolerate silences?
always, often, usually, seldom, never

Do I allow sufficient waiting time for you to answer questions?
always, often, usually, seldom, never

Do I use questions to show connections between previous and new learning?
always, often, usually, seldom, never

Thank you

Please put completed questionnaire in the box in B8

Questionnaire on questioning

Please circle only **one** of the following after each statement:
always, often, usually, seldom, never

Do I use questions to begin active enquiry?
always, often, usually, seldom, never

Do I use questions to start discussions?
always, often, usually, seldom, never

Do I use questions to involve all students?
always, often, usually, seldom, never

Do I use questions to extend knowledge?
always, often, usually, seldom, never

Do I use questions to encourage discussion?
always, often, usually, seldom, never

Do I use questions for problem solving?
always, often, usually, seldom, never

Do I use questions to encourage interaction?
always, often, usually, seldom, never

Do I tolerate silences?
always, often, usually, seldom, never

Do I allow sufficient waiting time for you to answer questions?
always, often, usually, seldom, never

Do I use questions to show connections between previous and new learning?
always, often, usually, seldom, never

Thank you

Please put completed questionnaire in the box in B8

Questionnaire on questioning

Please circle only **one** of the following after each statement:
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Do I use questions to begin active enquiry?
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Do I use questions to start discussions?
always, often, usually, seldom, never

Do I use questions to involve all students?
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Do I use questions to extend knowledge?
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Appendix iii

Transcription of one hour's teaching

Transcript of questions asked in one hour of a teaching session

1. Who has passed the skills tests?
2. Is he coming over?
3. When?
4. What about Jane?
5. When?
6. It's usually about 2 hours isn't it Tracy?
7. Is there anything else anyone wants to ask before we start the focus or this session?
8. I gave you two scenarios, Diane and Martha and a chapter from Pollard, can we go to the reading of Diane and Martha first?
9. Can we start by recapping, recalling the session from last week?
10. What was the overall theme from last week? *(discipline)*
11. What is another way of discussing discipline? *(behaviour management)*
12. How did the content of the session last week help you in your understanding of behaviour management and the use of strategies, such as where problems occur?
13. Good, you identified those key points where inappropriate behaviour might occur, so why do children get restless? *(tutor answers own question, the weather, time of day, hunger)*
14. What do you think are the key points in a lesson where it is most likely to occur?
15. What do we mean by transition time in the class relate this to your experience?
16. Overall then what key points did you take away, what will you use in the future?
17. Good, involve the children and agree the class rules. Did anyone see that in their setting?
18. Analyse, Did you feel that was positive? How? Why?
19. In term of enforcing the rules how did that encourage them to behave, apply this knowledge? Sijah?
20. Were the children involved in formulating them relate this to the research?
21. Anyone else like to offer any key points?
22. So you as a role model is important and anyone coming into he classroom, why?
23. What about this table, draw some conclusions?
24. Can anyone remember anything about the use of praise?
25. Yes, praise, genuine, not too often, good, anything else?
26. Yes that's linked to what Tracy said that they need an instant reward, don't they?
27. Linked to behaviour management we looked at something else, what was that? *(behaviour in the playground)*
28. No I'm thinking about something that was related to the classroom, anyone else?
29. Have you glanced at them?
30. I'm going to ask for 2 points from each table, Can you discuss the scenarios on your table and then give me 2 points that you feel are the most important and give the reasons?
31. What came out of the reading, draw some conclusions?
32. Can we have some contributions please, relate to theory and practice?
33. Will that table like to start us off?

34. So self esteem is important, do you remember when you came back from school and some names were not put on children's work?
35. Have you all found the evidence that relates to this point and what it looks like?
36. Another point please Catherine apply your views to practice?
37. Good point, I don't think I've had that before, did anyone else pick that up, apply it to personal experience?
38. So you're agreeing on this table about this, can you expand?
39. Were their professional roles different?
40. Give me something else that you took away, that was important from this, demonstrate your answer with example? *(role modelling for the children)*
41. Good. Moving away to organisation, if you go into a classroom that's chaotic what messages is that going to give you about the teacher, the type of teaching and possible causes of any misbehaviour, draw some conclusions? *(tutor answers, not focused, uncertain of what teaching and this has an effect on children and worked produced)*
42. Why do you think in this instance that the teacher's comments don't match up, give reasons?
43. What could help her know the children well, what could you do?
44. Yes Catherine, this is one of the targets put down for next School experience, would you like to tell us, if you can remember it?
45. A comment such as needs to concentrate more, is that a help to parents, how?
46. Will that help parents feel like they know my child?
47. In terms of what you are saying bout these scenarios, obviously we've got some positive and negative features, was there anything on your school experiences that was familiar to either of these scenarios?
48. Did you see anything similar in terms of organisation or behaviour?
49. Why else can it be effective? Steven said it is effective for the child from the illustration he's given but how else can it be effective, summarise using experience and reading.
50. Is there anyone else who has something to draw from their school experience, linked to management or discipline?
51. If you go into a setting which appears to be unstructured how do you go about moving this round?
52. How could you do that, apply to practice?
53. Are you saying that sensitivity and tact is required?
54. How can you change other peoples' practice? *(answered by tutor, a good way is by modelling good practice yourself)*
55. Is there anything else anyone wants to raise or give example of which you will do since discussing this issue?
56. Can we go to Pollard now?
57. Is there anything in that chapter which you felt was different or additional to what was discussed last week, what are you drawing from?
58. Did you think about the phrase the parents being the child's first educator and how this affects you*?(tutor answered this)*
59. Another point, as I can see lot of highlighting?
60. So are you saying there are advantages and disadvantages?

61. Do you remember what makes a good learning activity?
62. Can you think about or give reasons why planning is critical in the planning process, draw on hat you already know?
63. Can you give me 3 reasons, use what you know now, work as a table or a pair whichever you feel comfortable with?
64. Have you got 3 things?
65. Have you included on your list what I've got on mine?
66. Sarah did you get anything similar?
67. Did anyone else get anything similar t the first one?
68. What about the second one?
69. Can you use these ideas and think about the mechanics of planning, of using planning to show how a lesson progresses?
70. Reorganise your thinking from experience and tell me what you talked about?
71. Did you think about time, relate this to what happened in the classroom?
72. What would you and the children do?
73. What about the others on that list, think about a problem?
74. Is there anything else you want to include, use school experience?
75. I think I heard Catherine talk about the last point, did I hear that last point, apply it?
76. Planning is another form of record keeping isn't it?
77. Did anyone get anything different from that list, relate it to what you've seen?
78. Good so that area of where the learning is going to take place, indoors or outdoors, you're saying is important, right?

Group discussions took place between the following questions

8-9 6 mins
23-24 4 mins
30-31 5 mins
40-41 2 mins
57-58 4mins
63-64 3mins

Appendix iv

Semi structured interview field notes

Semi structured interview with PGCE EY students 2005/06

Aim
To discover students' perception of the role of questions in learning:

- What do you think the purpose of questioning in PDE sessions is for?

To involve all students
check understanding
Ask for opinions

- In which ways did questions help you learn today?

Made me articulate what I was thinking
Got ideas from others answers

- How can the use of questions affect the classroom climate?

Used to be scary when we first met
because unsure of each others reactions
Now good because discussion follows
questions and we feel we belong + can contribute

- How do you feel when questions are directed at you?

Prefer it when my name is used first
rather than at the end of the question
okay as questions often about something
we've talked about or know so feel unthreatened

- In what ways do you respond to a questioning approach?

Depends on how question asked
Don't like too many like a balance
- being told about something then asked
for opinion

- In a course such as PDE what is your preferred style of teaching and learning?

Like enough information to base a
discussion on. Like working in different
groups. Like a context, like a video, as
a context - all seen same thing yet pick up diff
perspectives

- What questioning strategy will you take into the classroom?

Use a quiet approach
Listen to answers
Value answers + use the answers

Semi structured interview with PGCE EY students 2005/06

Aim
To discover students' perception of the role of questions in learning:

- What do you think the purpose of questioning in PDE sessions is for?

To encourage participation
To involve everyone so session isn't all tutor talk
To gather opinions

- In which ways did questions help you learn today?

Challenged my opinions - had to justify my views & by trying to do this they changed
The 'devil advocate approach' made me think critically

- How can the use of questions affect the classroom climate?

Depends on how questions are asked & type of questions
Makes the group lively - size of gp means that all involved

- How do you feel when questions are directed at you?

Doesn't happen in threatening way so okay

- In what ways do you respond to a questioning approach?

Positive as long as not too many sometimes questions go on too much

- In a course such as PDE what is your preferred style of teaching and learning?

Like views & experiences presented & an opp to discuss them. like the fact that not told what and how to teach but discussion helps me make decisions

- What questioning strategy will you take into the classroom?

Asking a person as part of a discussion gp like probing back
Asking clear questions & having answers respected even if answers not what anticipated
Valuing answers - not being sarcastic about answers.

Semi structured interview with PGCE EY students 2005/06

Aim
To discover students' perception of the role of questions in learning:

- What do you think the purpose of questioning in PDE sessions is for?
To keep us all involved
check what we know & how it will be useful
in the classroom
Gives you a rest while we discuss answers

- In which ways did questions help you learn today?
clarify learning objectives
helped me because I was asking the same
qu. myself. Linked what we were talking about
to what we've got to do in school.

- How can the use of questions affect the classroom climate?
Make it or break it
Depends on teacher, way they're asked &
how answers are dealt with

- How do you feel when questions are directed at you?
Recall ones okay as I've got a good memory
friendly atmosphere so don't mind to I
make a mess or don't know

- In what ways do you respond to a questioning approach?
Okay as long as there a purpose to Qs
Still like to be told things - must have
some input in order to answer, need
points of reference - practice in reading

- In a course such as PDE what is your preferred style of teaching and learning?
like discussing & like recording discussions
important to summarise learning & teacher &
then to whom? oneself

- What questioning strategy will you take into the classroom?
Make sure most Qs are asked in a friendly way
Make use of answers
Repeat back answers & ask for a bit more -
use of follow up Qs important
Avoid have you got any Qs - children will
sometimes go on.

Semi structured interview with PGCE EY students 2005/06

Aim
To discover students' perception of the role of questions in learning:

- What do you think the purpose of questioning in PDE sessions is for?
Find out what's already known about the topic
check understanding of what is being discussed
Challenging viewpoint already held

- In which ways did questions help you learn today?
Helped clarify thinking
Put order into what was being taught
Vocabulary in questions confirmed what we were talking about

- How can the use of questions affect the classroom climate?
Involve everyone - usually
Prompts everyone to offer a view
Depends on how they are asked - this helps sense of belonging - sometimes unsettling as question asked - don't know the answer

- How do you feel when questions are directed at you?
Depends at what stage of the session
Beg. of course - but hesitant as didn't know where everyone else was in terms of their knowledge + experience

- In what ways do you respond to a questioning approach?
Like it as think 'you' are interested in the answer
Okay if not used like a 'machine gun'

- In a course such as PDE what is your preferred style of teaching and learning?
Balance of information + time to discuss issues Don't like when everything left to group discussion

- What questioning strategy will you take into the classroom?
Open questioning so children can show what they know + understand
The use of follow up questions - trying to probe thinking - where the answer has come from
Using names - asking questions in a non confrontational way

Semi structured interview with PGCE EY students 2005/06

Aim
To discover students' perception of the role of questions in learning:

- What do you think the purpose of questioning in PDE sessions is for?

- assessing own knowledge
- pulling blocks together to help understanding
- ask questions to help legitimise our actions + what we see.

- In which ways did questions help you learn today?

questions help me question

- How can the use of questions affect the classroom climate?

actively share opinions
prompts discussion

- How do you feel when questions are directed at you?

Fine

- In what ways do you respond to a questioning approach?

liked being asked opinions
- have a stake in learning

- In a course such as PDE what is your preferred style of teaching and learning?

enjoy seeing things + being told

- What questioning strategy will you take into the classroom?

open ended
- mindful of their abilities competencies
- avoiding patronising

Semi structured interview with PGCE EY students 2005/06

Aim

To discover students' perception of the role of questions in learning:

- What do you think the purpose of questioning in PDE sessions is for?

To check understanding of the topic taught
To make us think about what we know + don't know and so make us ask questions about ourselves + ask you ?s To challenge some of our ideas as we might have picked up wrong messages in sch

- In which ways did questions help you learn today?

Made me remember what I know. Found out what others knew & was thinking. learnt that all opinions can be valued. Not everyone has an answer and that's okay

- How can the use of questions affect the classroom climate?

Can make it quite lively, depends how ?s are asked. Remember when at school didn't like too many ?s got anxious about my turn & what I'd be going to say

- How do you feel when questions are directed at you?

Okay now that we all know each other & knew Joy & that she isn't picking on anyone like it better when questions are aimed at me after some table discussion

- In what ways do you respond to a questioning approach?

like it as it means my opinion is being considered. A response to answers is good rather than question then asked to someone else - don't know what you think of the reply

- In a course such as PDE what is your preferred style of teaching and learning?

Like discussion but like being told things & given examples from practice - not too much anecdotal stuff tho' as all schools children are different. like it when reading before session is discussed.

- What questioning strategy will you take into the classroom?

Try and value children's answers so they won't be put off answering in the future
Use children's names but not in a threatening way. Be aware of my facial expression when asking questions. Don't just take the first answer always try to follow on answers. Use at the end to check what everyone knows what they've done

Semi structured interview with PGCE EY students 2005/06

Aim
To discover students' perception of the role of questions in learning:

- What do you think the purpose of questioning in PDE sessions is for?

So classroom isn't a quiet passive environment
To remind students what work done.
To clear up terminology

- In which ways did questions help you learn today?

Learned about other people's views
learned why it is important to wait
for answers & not rush people

- How can the use of questions affect the classroom climate?

Can feel like a behaviour management
strategy - feel picked on

- How do you feel when questions are directed at you?

Okay as long as my answers are considered
& do not just a strategy to keep me involved

- In what ways do you respond to a questioning approach?

They're okay as long as they are not trivial
& just used to make someone speak

- In a course such as PDE what is your preferred style of teaching and learning?

Time to really develop discussions - things
are rushed and we move through things
quickly, understand why but sometimes I want to
ask questions at the end but too late

- What questioning strategy will you take into the classroom?

Not rushing questioning
Giving children the right time to ask questions

Appendix v

Peer observation feedback comments

Peer Observation
Observer:
Observed: Joy Roberts
Date: 18th April 2005

Context
PGCE (Early Years) programme based at Warrington (early start from home to arrive in good time for teaching)
11 students (some late arrivals)

Focus of observation
General concern about the intensity of this year long course and the tension between content coverage and the promotion of 'thinking skills'. Currently, you feel that you 'give' too much, rather than let the students make personal sense out of or work through certain issues for themselves. Particular request by you for me to evaluate the range of teaching strategies you deploy and your quality of questioning and your use of trainees' responses.

Feedback
From the outset there is plenty of evidence of you caring a great deal about your teaching and, more specifically, the quality of learning that you are promoting (Session plan, handouts, video and detailed thought about the lesson observation itself). A range of teaching strategies are deployed to good effect (ie questioning, explaining, task setting etc).

The room you are teaching in is small but not claustrophobic and the group you are teaching fits reasonably well into it. That said, there isn't much room for practical type activity. As the students enter the room there is much evidence of close relationships between you and each of your students. Discussions you have with various individuals indicate an intimacy, reflecting a more holistic approach towards the teaching and learning. The students are friendly with one another too and the atmosphere is very relaxed.

9:05 – Quick register. I did wonder if this was necessary to begin with but then you checked up on their length of half term during this process which was useful.

9:07 – Introductions carried out. You reference a slight shift in content structure to that given in the handbook. This, I believe, is good, showing a sense of flexibility in the way you deliver the curriculum. You then reference the students to the Teaching Objectives, not the Learning Outcomes. In doing so, you are focusing on what you will be doing at the expense of communicating to the students what they will be doing or will be able to do by the end of the session. In future I think you should emphasise to the students their roles and responsibilities in terms of the learning. At this point, I notice one student starting to record what you are saying – presumably you are aware of this.

Having shared the focus of today's session you then draw the students to the 'standards'. Requesting the students to highlight aspects of the 'standards' gives a strong rationale for the session. At this point, students are working (in the main) on their own. I wonder if it might have been more constructive (in terms of learning) to have encouraged them in small groups to work together and also prepare them to feedback on what they have highlighted for each of the standards.

After approximately 5 minutes you pick on individuals to feedback their findings. Responses are expanded on very well and further detail of the standards is given to help the students to make good sense out of them. An expansion/elaboration on a response is usually followed up with a probing type question. Students are encouraged to share personal experiences.

9:26 - Standard 3 focused on. You question the different tables, asking different students to feedback. Good linkage with previous standards is made and to previous learning. Useful information on the website is referenced too.

You may wish to consider the use of students commenting on one another's responses rather than the onus always being on you. Students could usefully be drawn on, also, to expand on peer feedback and to probe further. Getting tables to summarise and clarify is another way of shifting the emphasis from you as teacher to them as learners.

9:30 – A worksheet is handed out for students to work through, this time in pairs. 5 minutes is given to the students to complete this task. At this point you hover, not joining in group conversation, but not stepping completely outside of it either (ie the students are conscious of your presences watching over them). Engaging with something else whilst they are getting on with the tasks would be better.

9: 34 – 1 minute warning given. Then you proceed to target individuals to question. Once again, you progress round the different table groups, asking students to enrich, further earlier responses. This is good and you should strive to do more of this but possibly in a less didactic way eg being silent when a student responds and encouraging students to voluntarily step-in and question.

9:42 – You reference part 2 of the task. I like how you modified their (students) working through of this task. I also think that the quality of the discussion that ensued was much more collaborative between you and the students. You were much freer with the targeting of some of your questioning and gaps of silence allowed students to step in and share their thoughts. That said, the students did tend to direct their responses to you, rather than to the whole group. You may wish to consider how you could encourage more genuine discussion between the whole group rather than between you (teacher) and them (students).

9:57 – You begin to summarise. Why not get the students to summarise? I also think that the quality of responses to the question about challenges of

working with others (ie sharing of their personal experiences) would have been enriched if the table groups had been given some time to talk amongst themselves in the first instance.

10:06 – Ensuing debate about the use of Classroom Assistants is rich and varied. Useful references are shared for students to pursue some of the issues raised further. I particularly like the task of comparing HLTA standards with the QTS standards. Such open type activities do tend to promote higher order thinking. Of course, such activities do lead to more unpredictable learning, but moments like these tend to be the most exciting and memorable.

To summarise:

Strengths

- Thoroughness of preparation
- Relationships
- Subject expertise
- Continuity and progression of learning

Areas for further consideration

- Thoroughness of preparation
- As much as possible, draw on 'out of session' activities/tasks to feed into the current teaching. This will allow you to focus on the process of learning, not just the content – which often can be rather low-level in terms of the quality of thinking being promoted.
- Focusing on LOs, and maybe encouraging the students to set some of their own. They might have some burning issues that they wish to explore in relation to the general focus that you may not have considered.
- Encourage them to clarify, question and summarise.

Appendix vi

Observation framework

Analysing your own practice

Type of question	Yes	No
Do your questions reinforce/visit the learning objectives?		
Do you involve all students?		
Do your questions motivate?		
Do you preface your questions with an individual's name?		
Do you ask your students to explain their thinking?		
Do you rephrase a question if you get no response?		
Do you reflect back? Eg So what you're saying is...		
Do you play devil's advocate?		
Do you promote justification and reasoning?		
Do you provide opportunities for students to explain the processes they chose as well as describe the outcome?		
Do you stage questions with increasing levels of challenge?		
Do your questions show connections between previous and new learning?		
Do you give students longer than 3 seconds to answer your questions?		
Do you do this in a way that fosters a positive climate?		
Do you encourage students to ask each other questions?		